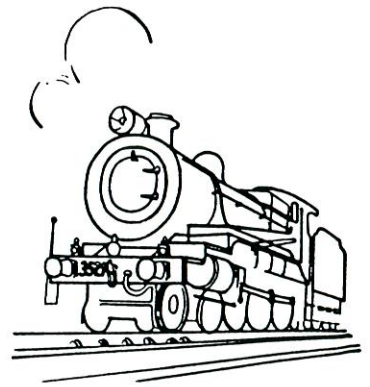


Sydney Live Steam Locomotive Society
 Anthony Road, West Ryde, N.S.W.



'Newsletter'

Vol.28. No. 2.
 May 2000.

Running Days.

February.

A hot dry summer day. The shade was very popular and the hoses were out to keep some minor grass fires under control. The numbers were not too bad for a hot day and there were the now usual couple of birthday groups. One of my school colleagues had her son's birthday party, the children had a good time but I think that Dad and the uncles enjoyed the afternoon as much, or more, than the kids. The birthday cake was good well.

On the ground level Henry, R class, led Max with "Bitza", on the outer running for the whole afternoon while the second set of cars was powered by Ken with the "Simplex" and Jeff, C3142 in the early part of the afternoon. Ken was then replaced by Barry Tulloch, D5037 to complete the shift. On the inner, Warwick, V class and Ray Lee, C3803, ran the two trains for the afternoon.

On the elevated we had Brian Carter, "Perseverance" with three cars, Jim Leishman, Ps4, two cars and the Mulholland G.W.R. pannier with one car. Jack Grierson ran his C38 with Mark Gibbons also at the regulator.

March.

The first running day for autumn was hot and humid. You would not have known how hard the dedicated, but slightly mad, March garden roster team had worked in the rain the previous Saturday cutting the grass, the hot house conditions during the week really promoted the growth. The crowd was small but one party group had the best asian banquet ever seen at the grounds.

On the ground level Barry Tulloch, D5037 doubled with Bernie, SMR 10 class, Matt Lee C3506 ran with Jeff and C3142. Max and Henry ran their usual combination with Max back in the lead. Warwick was forced to retire the V class when it failed with petticoat pipe problems.

The elevated track had a good variety of motive power, Jim Leishman ran the Ps4 with 3 cars and van, Paul Taffa and the Hunslet took two cars, Brian Carter "Perseverance" ran three cars and a van. The Jack Grierson C38 ran with either Jack or Mark Gibbons in charge. The new weed killing wagon was on display and the Murray's Ruston 0-4-0 diesel locomotive had been given a test run.

April.

A top autumn day. Early in the afternoon it looked that everyone had other things to do as the crowd was very light, but, later it built up to a very pleasing number. One of the birthday party groups were one of the parties that were very glad that we had operated our limited service at this time in 1999. They commented on how good the grounds looked with the track back together and the landscaping completed.

Brian Carter "Perseverance" took 3 cars and a van while the Mulholland pannier ran two cars on the elevated. The ground level roster saw Warwick, V class, Ray Lee, C3803, John Hurst 4-8-2 and Max Gay "Bitza" double heading with Barry Tulloch, D5037 in charge of trains.

The AALS 2000 Easter Convention.

Report by Bernie Courtenay.

The Convention at the QSMEE track at Warner in Brisbane was a most enjoyable event. Several members of our Society attended including President, Warwick Allison with family and "V" class and WAGR train.. Son, Andrew, was presented with the under 25 Achievement Award for his model of a Qld. A10 class tender.

The grounds at Warner (near Strathpine) are a delight with stands of eucalypt and many native shrubs. Comments were made about how much work had taken place since the "last" time our members visited (last

century !). There was a definite feeling of being in the bush, and to reinforce that, a koala was seen camped in a tree quite close to the steaming up bays, apparently unfussed by all the activity. The track is 7 1/4" / 5" , well laid out as an extended oval and includes an impressive spiral at the "top" end, and a long and very high trestle bridge on the return leg. A small yard and busy station area as well as carriage shed, shunting necks etc., completed the layout. As well as there are three "locos" - one for 7 1/4" / 5" , another for 5" plus 3 1/2" / 2 1/2" and a third 7 1/4" / 5" out in the "bush". The small gauges run on a very nice elevated track of concrete construction in the centre of the grounds, surrounded by trees and grassed areas.

A small canteen served the members and guests with an adjacent covered area for eating and " shooting the breeze ". Here morning and afternoon teas were served (in large amounts). Down the path is an impressive new amenities block. I should emphasise how obliging the QSMEE members were - nothing was a trouble and this contributed to a very friendly few days.

There were a number of trade tents in the grounds which were to blame for a drop in my bank balance, but that is usually what happens at conventions and I came away with some very good things.

There was a very good roll up of engines, especially Qld. types as you would expect, and the quality of the miniatures was high. Eric Evans won the Bolton Trophy for his fine 5" gauge cane engine "Babinda". The gong for the most popular engine went to Bob Nash and his beautiful Southern Ps4 in 7 1/4" gauge. There was also a prize for the deepest flanges and I'm sure Bill Richards would like to see a similar award at West Ryde. Joe Huntley received two cans of pink paint as a helpful gesture designed to encourage him to paint his magnificent 5" Fowler cane engine. Besides all the trophies, there were a lot of model engineers out on the tracks going round and round till all hours, enjoying them selves. An interesting elderly model was displayed at the tea tent over the weekend, that of a LBSC "Uranus" in 2 1/2" gauge built c. 1938. The builder had sought advice from LBSC via. the English M.E. , and a copy of the reply, concerning piston rings, was also displayed. The model was well preserved on a stand fitted with a mirror so you could see the centre valve gear etc. Alan Mackellar remembers the engine and its owner. I observed a number of design features on this engine which were very similar to the Esdaile "Princess Royal" now in my possession.

Meals were served in a marquee at the top of the grounds. This required a five minute walk from the station, or much better , a train trip on a special service setting down outside the venue. I am pleased to report that at 5pm every evening a " happy hour " was called at the canteen. It was only necessary to position oneself close to the counter just before 5pm to avoid being crushed by the Edgeworth members. Memories of the Cobden "booze bus ". However I jest - thanks to Jeff Wakenham and John Austin for some great company.

The weather was mild and the opportunity was taken to undertake some trips around the Pine Rivers Shire, also to the Bracken Ridge and Bribie Island tracks. I was introduced to Neil MacKenzie, the father of the Bracken Ridge track and builder of many fine Qld. locomotives, and a very nice bloke. The track is in a public park and is manned by the local Lions Club. It is 5" gauge laid in concrete and grassed up to the concrete strip. It rides very well, in fact I was given one of the fastest trips I have ever had on 5" gauge, in company with the Allison's, behind a C38 class.

I also drove up to Bribie Island and dropped in on member Trevor Arney and wife June who now live in a very nice home overlooking the water. In typical Qld. style Trevor gave me the grand tour of the Island including an inspection of the Bribie Club track, although no one was running on the day. The railway , 5" gauge, is in a very pleasant setting, close to the water, with plenty of grass and trees and looks like it would be a lot of fun to operate.

The Allison family and I took a drive through the hills north of Strathpine to Woodford where we stopped for lunch and to have a ride on the preserved 2' line there. It is actually built on the abandoned foundation of a 3' 6" branch and goes for about 750 metres, terminating at a nursery and gardens. The engine was a Bundaberg Fowler 0-6-2, the one that will be filmed later this year visiting a number of Qld. mills, as part of a TV documentary. All good fun, especially the open four wheel truck (3' 6" converted) , and with many 2' gauge steam engines stored in rows, about 1000 years of restoration work for the cheerful bunch who run the show.

We then drove through sub-tropical mountain scenery eventually to come to the Qld. Tram Museum. It was a bit late in the afternoon and quiet at the Museum, but nevertheless, the rostered driver and conductor proceeded to bring out every serviceable tram for us to ride in complete with historical narrative and engineering facts. Well done !

I flew back to Sydney on Tuesday evening, and in case you don't already know, I copped a cab ride into Mascot in the cockpit of the 767. A huge buzz and a "I wish I could do that" admiration for the skill of the young technical crew.

Next year its Penfield, S.A., followed by Tassie the year after. See you there.

AMBSC & AALS Meetings

Well another convention has come and gone and the meetings have certainly progressed orderly. The highlights include:

- Our AMBSC motion last year on Boiler Inspectors qualifications has resulted in a proposal that is on the table for consideration by all Societies. Pending comments we will move a motion that it be adopted, and this will then be put to clubs with the next convenient mailout for formal voting. I would expect it to be in (if adopted) by the end of the year. A copy of the proposal is on the notice board.
 - Our motion to AALS on the deletion of the 5 inch gauge fine wheel standard was adopted. This is a significant step forward in the standardisation in this gauge.
 - Jim Organ (Richmond River) has been nominated as Chairman of the Australian Live Steamers Safety Committee, while Ken Belcher (Castledare) has been accepted as Secretary. This committee is the AMBSC equivalent on the Operating side and this is the first time that these positions have been filled. Barry Glover was returned as President.
- Mark Watkins has stood down as AMBSC Secretary. Mark has done a good job in liaison with the authorities and it is a pity his work commitments have prevented his ongoing contribution in this position. Also Ross Bishop-Wear has stood down as NSW representative.
- The convention next year will definitely be at Penfield, South Australia. The 2002 convention will be held at Evandale in Tasmania. This is a lovely location, and while the track is not large by usual convention standards, the usual gauges are catered for. I think the order of the day will be small locos, and then a tour of Tassie!

Lake Macquarie Live Steamers Birthday Run.

Several members attended this run on a reasonably warm weekend in February. As usual, some of the SLSLS contingent partook of morning tea and then retired to the local cultural establishment (air conditioned of course) for lunch, returning in time for afternoon tea. For those that stayed a complimentary BBQ was held on the Saturday evening. A very enjoyable day was had by all.

President's Breakfast and Kids Day

This early morning gastronomic event was commenced on time at an unearthly hour and by the arrival of el residente at 8.15, the first of the BBQed goodies were off the BBQ and being devoured by the hungry hordes. Many thanks to Bill for his careful selection of high quality foodstuffs. Special thanks to Sue Carter for braving this male event and helping out with the organising. Kids Day was held following the President's Breakfast. The Malcolm Sargent Cancer Fund had organised this day for some of the sick kids to have a nice day out riding some trains, having a BBQ lunch and being entertained by the some Channel 7 TV children's characters (whose dancing and antics also entertained our members!) Good loads were had by those trains running, and everyone was well behaved. Bart Simpson and Co. had a ride and he was quite well behaved and kept his feet on the footboards at all time, even though they considerably exceeded structure gauge, and only just got past our ground signals! trains running included Jim Leishman and the Ps4, Max Gay with Bitza, Henry Spencer with the 'R', Warwick and the 'V', and Brian Carter with Perseverance (Brian-those loads are out of all proportion to the size of that loco!) The weather of the previous week probably kept some away, but those attending were a good crowd and it certainly seems they all had a good time.

New Locomotives.

BLOWFLY. Notes provided by Brian Rawlinson.

"Where is your loco? Haven't you finished it yet?" was the usual greeting when meeting one of our members from out of town. He usually continued with - "it should only take six months to build a Blowfly". This conversation was repeated many times for several years as my scrap box gradually occupied more space than the completed parts of the locomotive itself.

While many variations of the basic design have been built, I have been content to follow, with a few minor exceptions, Barry Potter's words and music, which really only caused trouble once when I slavishly followed

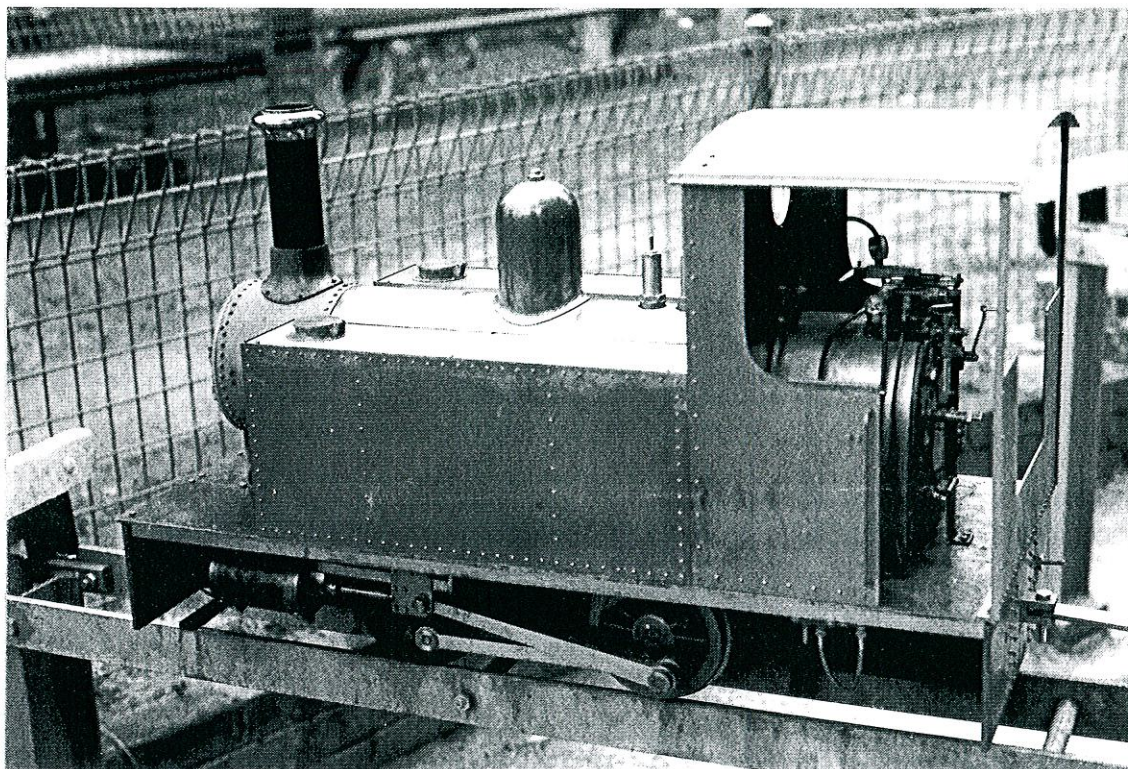
the plans for the whistle valve and finished up making a safety valve ! The main changes included a removable smokebox front, a re-location of the safety valves, a different chimney base , and the spectacle plate and cab sides were made as separate bits rather than all in one piece.

During the building of the locomotive, I was fortunate enough to be able to tap into the vast knowledge of locomotive construction which exists within the club. Also, members very generously helped with the supply of materials when needed, and made the manufacture of some parts much easier with the use of their specialised equipment.

Barry is to be congratulated for the development of a substantial but simple locomotive suitable for beginners and the engine is certainly as friendly to drive as the parts were to assemble.

And now, I'm inevitably asked - what's next?

(Brian, the same out of town member seems to ask the same questions about my Z19. John L.)



Photograph. Mark Gibbons.

TINKERBELLE Notes by Mick Murray.

The February Newsletter reported the arrival of a " non steam locomotive..... reminiscent of a Ruston type industrial shunter." At last Scott and I had a prototype to claim as heritage for " Tinkerbelle " our newly completed industrial diesel.

A gradual declining interest in HO scale combined with an increasing awareness of the attractions of large scale models, led to the purchase of several issues of Model Engineer and AME in the early '90's. Almost instantly visions of a live steam 0-4-0 industrial shunter began to emerge, accompanied by rough outline sketches. The vision began to materialise in the form of some steel wheel blanks when reality began to take hold and thoughts turned to a somewhat less ambitious first project.

In about 1993, Model Engineer ran a series of articles on " Fred " a rather nondescript diesel outline electric industrial locomotive. It was on the basis of " Fred " that the concept design of the locomotive that would eventually be known to us as " Tinkerbelle " began to emerge. There were two over - riding design precepts:

1. The locomotive would look convincing ; and 2. The "works" would be hidden from view.

Originally planned for battery power, ideas began to form on the sketch pad, adapting ideas, such as suspension arrangements from "Fred". About this time the chance find of a Briggs and Stratton engine at a swap meet, followed by a quick technical conference and assessment of available funds, sealed the motive power choice for the locomotive.

With work and family commitments, work progressed faultingly over the years between 1994 and 1999, with a blood rush in late 1995 when the Builder's Plate arrived proudly announcing a 1995 construction date - another four years and many changes in detail were to pass before the first road trials just after Christmas 1999.

Several variations of drive line were considered, some trialed, and most discarded, before settling on a centrifugal clutch on the engine shaft, a reduction chain drive to a reversing gearbox, and a further reduction to a layshaft before the final drive to the axles. The gearbox was based on two main components - a double plummer block from the same swap meet as the engine, and a set of lathe tumbler gears, all set in a supporting frame and arranged for oil lubrication from a wick feed system. Reversing was accomplished via a screw reverser, chosen primarily for its self locking feature.

The locomotive is fitted with both hand and vacuum brakes, with the vacuum brake handle in the cab activating both a pneumatic valve and a micro switch which controls the exhauster. The exhauster, along with a sealed lead acid battery, will reside in the riding car currently nearing completion.

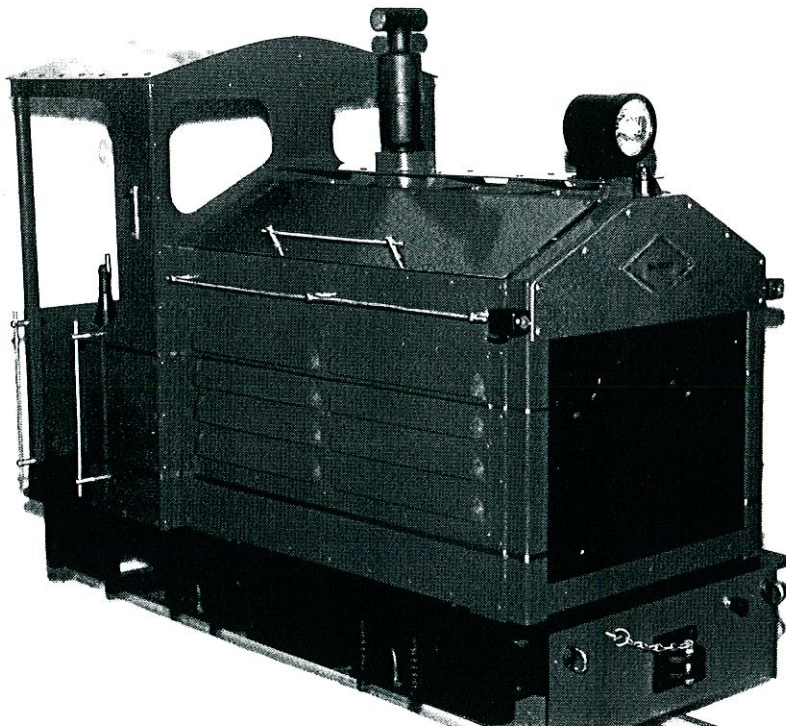
Marker, head and cab lighting was installed, along with an electric horn and a pair of computer fans to circulate air around the engine.

Trials over the period between December 1999 and March 2000 have indicated the need for a number of modifications including the addition of 15kg. of lead ballast, stiffening of the reverser base and conversion of the gearbox tumbler gear bearings from oil lubricated bushes to ball bearings. These latter two modifications are under way and it is hoped that both locomotive and riding car will be roadworthy for the Hot Pot run in June.

Specifications.

Length:	32".	Width:	14".	Height:	24".
Mass:	Approx. 200lb.	Wheel Diameter:	4"	Power:	3hp.
Brakes:	Hand/Vacuum.	Max. Speed:	12mph. (approx)		

And the name "Tinkerbelle" ? - well, that's another story.



Photograph. Mick Murray

Anniversary Book

There are still copies available. Cost is \$7.50. See Warwick or the ticket seller on running days.

Membership News

Mark Gibbons was elected a full member of the Society at the April meeting—congratulations Mark, we trust your association with the Society will be long and enjoyable. An application for provisional membership has been received from David Thomas. This will be considered by the Directors at their next meeting in July. David has been around the grounds for a while and should be familiar to many members. Members should be aware of the recent passing of Hugh Ryan and Colin Wear. Hugh was a member until about 2 years ago and regularly sold tickets for many years. Colin was an active steam enthusiast and retained his membership even though moving to the mid North Coast some years ago.

Members Drinks, Ice Creams & Telephone Calls

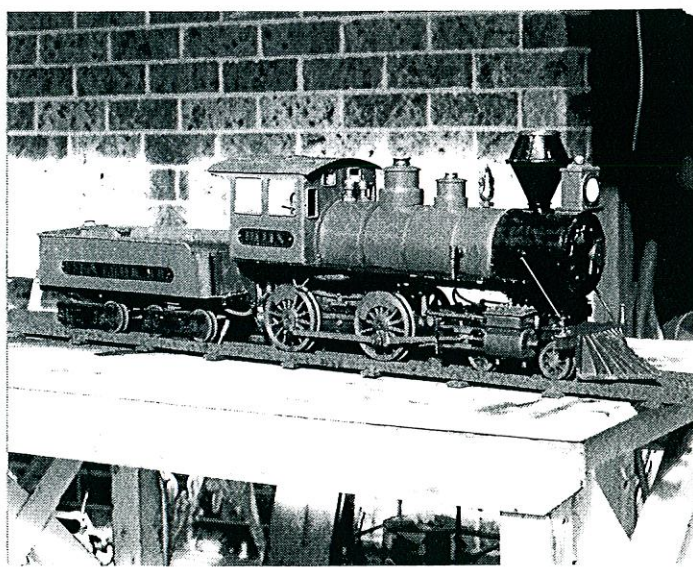
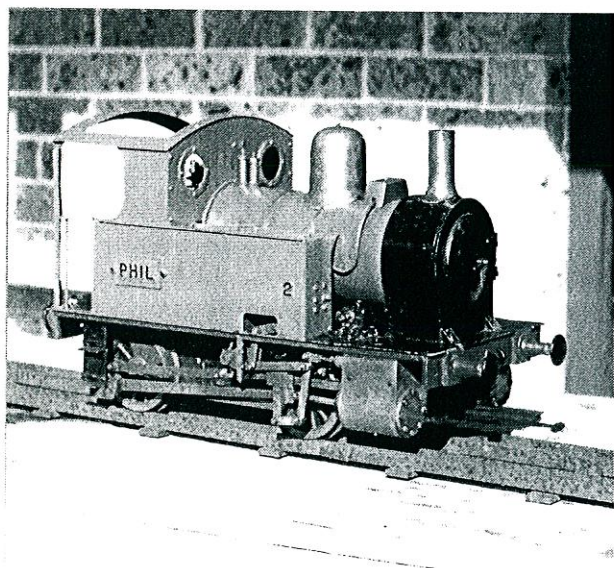
Members are reminded that drinks, ice creams and use of the phone may be had by members at any time. Correct payment must be made into the tin at the time. (Please no pay later!—we all tend to forget these things.)

Sale by Tender.

Members will be aware of the recent passing of Hugh Ryan. Hugh had built two locomotives, a 3 1/2 inch gauge LBSC "Virginia" and a 5 inch gauge Don Young "Railmotor". These locos have been offered to the Society, and in discussions with the family it was decided that they be offered for sale to members with the proceeds going to our charity.

These locos have been at the grounds for inspection. The sale will occur as follows:

1. Members are invited to submit a written tender.
2. If tendering for both locos, a separate tender should be submitted for each.
3. The tender should clearly state the loco being tendered for, the price offered, and the name of the tenderer who must be a currently financial provisional or full member of the Society.
4. The tender should be with the Secretary by 9am, Saturday 3 June 2000, which is the closing date for offers.
5. The successful tenderer will be advised as soon as possible following the opening of the tenders.
6. Payment will need to be finalised within 2 weeks of being advised, otherwise the sale will lapse.
7. The opening of tenders will be overseen by the Directors (except any Director who submits a tender).
8. The successful tenderer will have offered the highest price.
9. If the purchase is declined when an offer is made, or the sale lapses, the next highest tenderer will be offered.
10. The decision of the Directors will be final.



Photographs. John Lyons

Works Reports

More Painting!!

Allan Cottrell, Brian Hurst, Bryce Peak and other Wednesday attendees have attacked the clubhouse following their work of art on the Signal Box. The doors, roller shutter, doors and window sills have all received attention. The grounds and facilities certainly look good with all this fresh paint around. Sue Carter is arranging new vertical drapes for the clubhouse windows.

Small Retaining Wall

Martin Yule has progressed this and has shown a deft hand at laying a good brick. The wall is a low level (3 course) wall along the edge of the new path and will (finally) retain the steep bank off the edge of the inner main.

Track Work

The outer main on the eastern side has been reconditioned with weed mat & new track. The formation here had slipped away on one side and built up on the other due to ground water leaving the track undermined and twisting under load. A similar problem on the inner main near 6 points was corrected on the morning of the April running day by the insertion of some new sleepers and ballast.

Ground Level Signalling

Two cantilevered gantries under construction by Peter Shiels have progressed to the virtually complete stage. The footings are in place and the structures will be galvanised before installation.

Plants & The Grounds

A few more shrubs have recently been planted around the grounds including our new grassed area reinstated after the drainage work.

September Olympic Run

Don't forget this! This is being planned as a 2 day event on the 16 & 17 September. There is to be public open days on both days, an exhibition of members work & historic locomotives in the clubhouse, and an evening BBQ for members on the Saturday evening (and running into the night as you wish). Any overseas visitors here for that other event will be especially welcome. A flyer is being produced and some targeted advertising will be done to the ARHS, and model railway groups etc,

Auction!!!!

The auction following at the April meeting of two items donated by Trevor Collett was led by Auctioneer Bernie. These are a clamping kit, and a magnetic base. The proceeds of \$40 was donated to the Malcolm Sargent Cancer Fund.

Camera Lens

George Robertson has come by a zoom lens, 35 to 55 mm focal length to suit a Minolta bayonet mount SLR camera. As George has no use for the lens he is offering it to any interested member.

Milling Machine.

MAS horizontal milling machine, table 38" X 10", three phase motor, auto feed to all axis, 100 or so cutters. \$1800. o.n.o. Contact Stuart Larkin 02 9634 4210.

Diary

21 May	Interclub Visit to Western Districts Live Steamers at Fairfield.
6 June	Annual General Meeting
June 10/11/12	Hot Pot Run, Illawarra Live Steamers, Wollongong.
17 June	Public Running Day
4 July	Directors meeting.
15 July	Public Running Day
1 August	Members meeting.
19 August	Public Running Day & next newsletter.
2/3, 9/10 September	Mudgee Miniature Railway invitation.
16/17 September	SLSLS Olympic Run!
30 September-1 October	Model Engineering Exhibition Monash University, Melbourne

Garden Roster.

- Jun. '00. W.Allison, R.Barlow, B.Kilgour, B.Millner, D.Mulholland, J.Mulholland, M.Murray, S.Murray, V.Scicluna, P.Shiels.
- July. '00. B.Courtenay, K.Baker, B.Carter, V.Condon, J.Grierson, M.Haynes, L.Pascoe, J.Sorensen N.Sorensen, P.Taffa.
- Aug. '00. J.L.Hurst, J.B.Hurst, A.Cottrell, A.Coucill, J.Leishman, J.Lyons, P.Lyons, B.Peake, M.Tyson, M.Yule.
- Sept. '00. B.Hurst, T.Eyre, P.Brotchie, M.Gibbons,, G.Kirkby, M.Lee, R.Lee, B.Rawlinson, B.Tulloch, J.Tulloch.

Gate Roster.

June. J.Mulholland. July. M.Murray. August. J.Noller. September. L.Pascoe.

Editorial.

Comment, by David Proctor, Editor of AME, in the Nov. Dec. 1999 issue poses a question as to where model engineering will head as we move into the 2000's. " I expect.....we will see the trend towards IC and electrical powered models continue to grow, probably at the expense of steam, and who knows what our great grandchildren will be modelling." As the SLSLS moves into the 2000's some of our members will be constructing steam locomotives making good use of the very latest technologies available for the shaping, cutting and joining of the metals from which we construct our models. I asked Ken Baker to record some of the techniques he is using in his latest locomotive building adventure. I feel that this provides some of the answers that David is looking for.

John Lyons.

Norfolk and Western 4-8-4 J Class Locomotive. by Ken Baker.

John asked me to write a short story for the Newsletter presenting my thoughts and ideas about the choice and construction of the N & W 4-8-4 class 'J' Locomotive. I will briefly describe some "*not quite traditional*" methods of construction and pose the question - "do I really know what I'm doing?"

After finishing the 'Simplex', my thoughts turned to building a larger prototype locomotive - something with '*presentation*' that would also work hard on running days with a minimum of fuss. The idea that the 'J' might fit the bill, came to me after I had read a book on Passenger Locomotives. It was a rather handsome engine and slightly larger than the 'Simplex'.

For two year's I researched and accumulated information on the 'J' before starting construction. During th time I was studying for a Diploma in Mechanical Engineering. I found that the information on the J that I had gathered was an excellent source of material for assignments. I could pick any component and use it in subjects such as AutoCad, Finite Element Analysis and Engineering Materials. This you may think is all very interesting, but what has it got to do with actually building a locomotive '*to play with*' when the need arises! Well, these subjects, as well as others, brought me to realise that there are new technologies out there that we, in model engineering, can use to our advantage. On the surface, the use of these technologies may seem rather expensive and out of reach of the average builder, but, with a little thought and planning, these methods can be quite economical.

The Boiler.

The plans for the boiler were all drawn using AutoCad. I found that using AutoCad allowed me to make '*constant*' changes to the drawings without starting from scratch each time and omitted the necessity to '*kill more trees*'. To generate a complete picture of the finished product, drawings can be inserted into one another demonstrating that each component fits together relative to each other. So.....theoretically.....if the components follow the drawing, then all bits will fit neatly together, QED.

Members, who have seen the various parts of the J's boiler, have mentioned that it's reaching legendary proportions. To assemble a boiler of this size in the traditional way, would not only require more Copper (\$\$\$\$'s +..) for the extra flanged joints but these joints would also be up to 10mm thick. This would create hot spots where water is restricted around the corners of the firebox. The amount of heating gas and silver

solder required to put it all together is also substantial. The solution was to TIG weld the sub assemblies. Bryce Peake supplied me with the address of a company that can TIG weld copper pressure vessels to comply with the AMBSC copper boiler code. A slight change of the boiler design was made to take full advantage of this process and to cut down on the length of weld used. The side walls of the fire box and the outer wrapper are formed around the front and joined with one seam along the centre line. This method eliminates all the tedious *'mucking around'* with separate throat plates. It also creates a smooth, single thickness curve around the foundation ring. Both the fire box and outer wrapper are formed in this manner using 4mm copper sheet. The barrel is rolled separately from 3mm sheet and will be welded to the outer wrapper to form the outer assembly of the boiler. The fire box has a combustion chamber and, as above, the whole assembly will be welded to form one complete unit with a single thickness wall for the entire perimeter of the foundation ring. For those interested in the -*"yes, but how big is it"* - question, the fire box is 348mm long and 212mm wide with a 255mm long combustion chamber. The tube plate is fitted with twenty three 16mm Dia fire tubes and four 32mm flue tubes - all 510mm long. To *'feed the wee beastie'*, the fire hole door is 100mm by 60mm. The barrel diameter is maximum allowable by the boiler code with an overall boiler length of about 1100mm. At the time of writing this, all the *'boiler bits'* weight in at 54kg's.

The Frame And Laser Cutting.

The prototype of the 'J' Class had a cast steel frame so I decided to produce an 'all welded assembly' that would more closely resemble a casting. The side frames are 16mm plate. These are used in conjunction with 8mm plate and cover most of the frame's 1622mm length as frame stretchers. All drawings relating to the frame assembly were produced using AutoCad, and for me, this is where the use of a computer really shines! Saturday morning crew *'regulars'* will have seen the colour prints of the frame, with coupled wheels and cylinder assembly attached as a 3D rendering. The rendering was produced from the standard third angle projection drawings by transforming those same drawings into 'solids'. By adding the solids together and applying some material finishes, the completed view is formed. Pretty 3D drawings are fine - but, you can't play with drawings!

Once I was satisfied with the arrangement of the frame drawing, I 'exported' the frame outline as a .DXF file onto a floppy disc. I gave the disc to a laser cutting establishment who then loaded my file onto their machine and the frame profile was cut. An outline drawing is no longer necessary. Supplying the program on disc avoids the expense of having to pay for a programmer. Laser cutting has the advantage of little or no distortion and cuts to 0.1 of a millimetre. This procedure saves hours of drilling, filing, hack sawing and milling to produce a finished item.

Conrods And Coupling Rods.

There is nothing special about the rods themselves, however, they were produced on a CNC machine. I found it quite intriguing watching a machine carve out a coupling rod from a featureless block of steel with no apparent guiding hand to move the cutter on its task. All coupling rods and the two connecting rods run on sealed, deep groove ball bearings. The little end of each conrod is connected to the crossheads using spherical plain bearings. This is to allow the coupled axles to follow the track and not transmit any twisting forces to the crossheads.

Cylinders and Valve Chest.

The cylinder assembly will be fabricated from a combination of brass plate and hollow bronze casting. After the individual pieces have been machined, all components will then be silver soldered together. However, this is where I leave standard practice! Rather than fitting cast iron liners to the cylinders and valve chests, with the inherent problems of obtaining the correct fit of the liner in the cylinders, I decided to 'chrome' the cylinder bores and valve chest liners. This method also works out to be less expensive. The need to buy cast iron stock and the time required to machine the liners, has been avoided. Chrome plating will resist wear and won't rust (as cast iron will). The idea of 'chrome plating' was suggested to me by Alan Mackellar and I decided to give it a go!

There you have it - my current project under construction!

P.S. Ken had the boiler and firebox at the grounds on the Kids Day. It is big, and the coppersmithing and the welding are very impressive. John L.

That 'V' Blast. by Warwick Allison

Members may have been aware of the petticoat problems I have experienced over the years with my engine. The petticoat was a 2 inch (id) brass tube (about 3 inches long), bell mouthed at the bottom and slipped over a

short downward extension of the chimney and secured by a clamp screw. This has not been the best of arrangements and occasionally it has fallen off mid running day, with a noticeable change in the beat & steaming. Well this has all changed and the new arrangements have created some favourable comment in the how the beat has sharpened and how good it sounds.

Before I decided on the new arrangement I did some research into full size arrangements. I was interested in Ted Crawford's recent injector series in AME, particularly the part of how a proper nozzle effects steam velocity.

I had also just finished reading the "Red Devil" by Wardale where some of the principles of a good exhaust were discussed, including the properties of nozzles to increase the velocity of the exhaust steam. I found some information on it on the internet (which I largely could not understand enough to be able to actually deduce some actual dimensions) and from asking around uncovered an article by Dr. Giesl in "The Engineer" of August 30, 1924 entitled "The Locomotive Blast Pipe" recommended to me by Stuart Kean. This is pre ejector days. I could not get the nozzle diameter to match the recommended size (it needs to be much larger, and I do not think it would be appropriate for our type of operation), but the other dimensions seemed sensible, so I set out to create one.

It seems that two basic criteria are that the chimney be as long as possible, and that the blast nozzle be about level with the bell mouth of the petticoat. My chimney was already 2 inch bore so this formed the third criteria. The final arrangement has produced a chimney 8 inches long. The top 3½ inches has a 5 degree included angle taper from the 2 inch chimney bore down to a throat diameter of 1 5/8 inch. The throat is parallel for about the next 1 inch or so, then the final 3½ inches have a taper out of about a 12 degree included angle with the lower part curved right out to form the bellmouth at 2 3/8 inch diameter. The final part of the bellmouth is the lower part of the original one cut off and silver soldered to the new chimney extension. This ends up placed about 1/2 inch above the nozzle, a dimension which allows easy assembly of the petticoat while the nozzle is in place. The lot was machined out of two pieces of 2½ inch diameter steel I had to hand. The final setup is certainly very solid compared to the previous arrangement.

Steam pressure certainly comes around quicker with this arrangement, and it sounds a sharper blast. Now I am thinking of doing something similar with the blast nozzle itself. A proper nozzle with a throat of 3/8 inch tapering out to a nozzle exit diameter of about ½ inch would increase the speed of the exhaust and control the expansion better. That's the theory, now lets see....

1988. Australia's Bi-Centennial year. Some Railway Events.

by Graeme R. Kirkby. cont.

On the 18th of October 4472 underwent a trial run from Eveleigh to Wollongong and return. Testing and evaluation of its performance was carried out with assistance of the Dynamometer car, DMC-1902. The crew for this historic first journey were two senior Eveleigh drivers. After a successful, early the following morning the engine set off on its two day journey to Melbourne, hauling a short train.

On the 18th December, 4472 returned to Sydney. In company with a train hauled by 3801, the two trains ran parallel over the last 7 miles from Strathfield, a feature which proved immensely popular with the lineside crowds as well as the passengers. This was not the first and was certainly not the last parallel running by 4472, a considerable amount including triple running side by side being done in Victoria on its first and second visit to that State.

It was a few weeks later that I found myself rostered as fireman on 4472. She was charted for a special to Moss Vale for filming purposes. Filming was already taking place when my driver and I arrived on a damp and overcast morning. Not being familiar with the handling of the locomotive despite a personal visit a day or two earlier, and having competent British Rail staff and support crew looking after her needs, my mate and I were not required to oil or attend the preparation of the locomotive. Just prior to whistling out time we climbed aboard and introduced ourselves to the support crew from the UK. After coupling up to our train, a short one, we set off from Eveleigh to travel via the East Hills line to Picton.

As we went along my mate and I were feeling our way with the engine but were getting a few helpful tips from the UK boys. We both found the locomotive a little awkward to operate at first and quite different from any of our engines. The cab seemed a little cramped although there were five of us there. Firing advice given to me was, "light and often and keep the fire saucer shaped..... just fire down the sides..... keep the back

corners well packed..... very little under the door and none in the middle of the box.” We tried the whistle which was a high pitched screech, but 4472 had also been fitted with a deep toned whistle while in Victoria (I believe from a South Australian 5” 3” gauge engine). This whistle was fitted below the foot plate on the driver’s side and was actuated by a foot air valve. It had a lovely deep note and when blown, each of its five chimes or notes could be distinctly heard coming in. We were startled when 4472 blew off at the safety valves - she really let go with a roar at 220 psi., sending a column of snowy white vapour high into the air. She steamed reasonably well although I did not have a full head of steam for much of the time. I put this down to my inexperience. I found it a bit difficult firing through the small “trapdoor” , especially into the back corners. The firebox is 42 square feet and is wider than it is long and I found trying to turn the shovel and propel the coal into each corner required a special art which I was yet to acquire. On a later trip after watching one of the BR Drivers expertise, I followed his example by using the shovel handle as a” lever” with the fulcrum half way along the handle resting momentarily on the fire-door mouth and swinging the handle in one direction while propelling the coal into the opposite corner - unlike our NSW engines with larger circular fire holes where we can “ shoot ‘ the coal into a corner in one movement. When the engine was being worked harder, extreme heat from the fire affected my right hand. Because very little coal was fired immediately under the firehole door , there for no bank of “green “ coal , the flames were licking at the door (unlike our firing practice on 32,35, 36, & 38 classes) and with my awkward and slow firing action)umerous heat blisters developed on my knuckles despite later wearing gloves. Evidence of my burns were with me ten months later.

The injector on the Driver’s side was good and strong and started very easily while the Fireman’s injector gave trouble whenever the regulator was opened (on exhaust steam working) but was quite OK when the regulator was closed. The engine was very economical on water. She rode OK although all springing was independent and not compensated but the UK boys were very concerned about the condition of our NSW tracks which they regarded as appalling, to which we whole heartedly agreed. “Flying Scotsman” was therefore limited generally to 100km /h (60 mph) but later in the year this limit was brought down to 80km / h (50 mph.) after heavy and continual rains had deteriorated the tracks further.

At Picton some filming was again carried out and a request for “ white smoke from the chimney “ was tactfully ignored. From Picton onwards our locomotive inspector who was travelling with us and a BR Driver took over and my Driver and I retired rather reluctantly to the lounge car on our train to take it easy, have a late lunch and listen to the soft , three cylinder beat for the next 33 miles to Burradoo. There we paused for a while. The sun came out at the right angle to illuminate 4472 in a classic pose with the English trees nearby as a backdrop.

The following day filming continued in Moss Vale yard. We got chatting to the BR Drivers and support crew in a more relaxed atmosphere and compared notes with our respective jobs. I was fortunate to have a drive of 4472 light engine up and down the yard and for the first time in my life used the vacuum brake (LNER type). The engine is fitted with large and small ejectors for the vacuum brake. For its Australian tour, the engine was fitted with a tandem compound air compressor (having one steam cylinder and two air cylinders all connected by a common rod) fitted under the boiler, against the front of the firebox just above the ash pan door. The engine was also fitted with an automatic air brake valve, which when applied, allowed the engine and tender vacuum brake to apply through a vacuum / air proportional valve while also applying train air brake as normal. I was surprised how well the steam pressure responded when firing just two or three shovels full of coal while standing, and of how well the boiler held its steam pressure for a lengthy time. Using the damper no doubt helped quite a bit, a practice we rarely used in my experience with NSW engines. On the 30th January 1989, 4472 worked a trial run to Gosford and return with a short train including diesel electric locomotive 8172 and the dynamometer car to further evaluate its performance and determine load limits for various grades. The following information is according to the Eveleigh depot crews who worked on 4472 and 8172.

On the Up journey a test was carried out on Hawkesbury River bank. Speed was reduced to about 5mph. through Hawkesbury River Station at the foot of the 1 in 40 bank. A BR Driver was driving and the support crew Chief Engineer firing. Twenty minutes were taken to pass Cowan. The load was approximately 264 tonnes plus 8172 was in dynamic brake mode developing just 50 amps or so for the whole distance. A full head of steam was evident at Hawkesbury River but was down a bit passing Cowan but still going strongly. She was worked hard and initially there was a little slipping. Speed settled around 15 to 20 mph. at about 65% cut-off. It was estimated she could haul another 50 tonnes up the bank but possibly not in wet weather.

The SRA later authorised a load of 260 tonnes. On later trips 4472 came up the bank in 16 minutes with a 255 tonnes and it was said that if the bank was a bit over a mile shorter (3 3/4 miles against 5 miles actual) she could come up on a boiler full of water with the 255 tonne load. It was also estimated that with a similar load, a run from Sydney to Newcastle would consume approximately 4000 gallons of water. (A 38 class would consume about 5000 gallons.)

During the following months the support crew and volunteers were kept busy at Eveleigh attending to 4472's needs. Cleaning fires, smokebox of cinders, disposing of ashes, cleaning the engine from end to end, coaling , renewing brake shoes and numerous other small jobs including attention to the exhaust injector which seemed to give continual trouble. A special cylindrical spark arrester of wire mesh was also fitted into the smokebox replacing the rather crude looking one consisting only of a number of vertical bars which looked as though it would be ineffective in the hot, dry conditions during summer.

On the 19th. March 1989 I experienced another trip on 4472 to Broadmeadow. Some points I recall about the trip was tight she was for steam on the rising grades from West Ryde to Hornsby but beyond there , as easy as pie. Closing the damper as we topped over Berowra kept the fire quiet, just below blowing off point and helped save coal. Running down the dip over Wallarah Creek between Wyong and Wyee we reached a speed of 72 mph. briefly and ascending the other side I could feel she was quite capable of going much faster if allowed. She rode quite well, I do not think any better or worse than a C38 at the same speed and it was just as noisy in the cab. She steamed very well on the easier grades, marginally better than a 38 with the added advantage of being lighter on water. On closing the regulator to run down a dip, I closed the damper and she held her heat and steam pressure without wanting to blow off. Just prior to the regulator being opened again, I reopened the damper and fed a round of coal - and the needle was right on the 220psi. In no time at all we were arriving at Broadmeadow where we were to be relieved and with reluctance we had to give up our charge. It had been a very enjoyable trip and a grand experience although once again I had two big heat blisters on the knuckles of my right hand despite having worn a glove.

Early in April another trip was experienced, again to Broadmeadow but with a load of 9 cars for 390 tonnes. This time we were assisted by the RTM's 5910 and therefore we were limited to a speed of 70km/h. Unfortunately we were delayed 75 minutes departing Sydney. I built up a good fire but have to admit I was fairly knocked up by the time we got to Hornsby. I managed to hold 180lbs. - 190lbs. steam on the 1 in 40's of which I was not very proud but with the 59 class behind us didn't have any appreciable effect on our progress. But we did have the injector on for virtually the whole time. This was due to a little drama we had on our way out to Strathfield. Previous to the trip the UK boys had been working on the exhaust injector trying to overcome its problem of not working on exhaust steam and they were hoping that for this trip it would be OK. We set off from Sydney and around Newtown we tried to get it going. It seemed to start and splutter on and off but never picked up. Over Petersham my Driver closed the regulator, we tried again and she went OK on "live steam but at Lewisham when he opened up again it fell off once more. We gave it up and went over to the Driver's injector. Water was very low in the glass. This injector had been running barely half a minute when the "Flying Scotsman" Engineer noticed that the steam valve gland nut for the injector was partly unscrewed. He took up a spanner and had just put it on the nut when there was an almighty "crack" like a rifle shot and something whistled past his ear while steam blew forth into the cab. For a moment one of us knew what had happened but when we turned the injector off we saw that the gland nut was right off its thread sitting on the spindle. That had been the crack we heard. What had gone past the Engineer's ear was some of the gland packing ! By this time we were at Strathfield. I got the fireman's side injector on and with water right in the bottom nut all of us NSW crew were just about having kittens expecting a plug to go at any second. We wanted to delay our start from Strathfield but our Engineer said "go", he'd have the gland fixed in a minute or so. So off we went and by Nth. Strathfield she was back in business again but we had a considerable deficit of water to make up. From Hornsby onwards our trip was once again very enjoyable and easy.

to be continued.

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Public Running Day is the THIRD Saturday in each month from 1.30pm. Entry is \$2 adults, \$1 children. Rides are 50c each