



NORTHERN DISTRICTS MODEL ENGINEERING SOCIETY (PERTH) INC.

March — April 2011

Bournemouth Club Points by Dave Burman

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I have attended a number of meetings at the Bournemouth Model Engineering Society on the south coast of England. Their track consists of a 1,000 m loop set in the corner of an attractive park on the outskirts of Bournemouth and includes an interesting set of points.

To enable engines from the steaming bays access the running track, they have constructed what only could be called a "bendy" point. The point can be set to enable a engine to run from the steaming bay line onto the main line, the next

Above: The line from the steaming bay is on the right, the point is aligned to the middle track which is the main running track. On the left is a spur track for the storage of riding coaches, a number can be seen parked on the spur.

Photo: Dave Burman

position allows through running on the main and is part of the main line loop, and a third position accesses a spur line where the riding cars are stored until required.

(Continued on page 3)

CALENDAR OF EVENTS

Event	Location	Time	Date
General Meeting	Club Meeting Room Vasto Pl, Balcatta	8:00 pm	Friday 13 May
Club Fun Run Day	Club Track Site Vasto Pl, Balcatta	09:00 am — 2:00 pm	Sunday 15 May
Public Run Day	Club Track Site Vasto Pl, Balcatta	10:00 am — 2:00 pm	Sunday 29 May
AMRA	Claremont Showgrounds	All day, each day of long weekend	Sat-Mon 4, 5, 6 June

NDMES
PO Box 681
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March General Meeting

The March General Meeting was held on Friday 11 March 2011 at the Lindsay Adams Meeting Room commencing at 8:00pm, chaired by Vice President Ken Austin.

The full Minutes of Meeting are enclosed with Steamlines as a separate Supplement for members. Some highlights of general interest are reproduced here.

Club Projects:

Station fencing has progressed and is almost finished. Work has again resumed on the inner 7¼ track and associated work. Bridge decking requires painting prior to any rain setting in.

Model Engineering: Richard Turner showed a novel way of machining packing glands.

The meeting closed at 8:50pm. Members enjoyed refreshments and a good yarn.

**Paul James
Secretary**



April General Meeting

The April General Meeting was held on Friday 8 April 2011 at Kentin Engineering in Malaga, commencing at 8:15pm, chaired by Andrew Manning.

Model Engineering:

All members present were presented with some fine engineering at Ken Austin's workshop. Ken is now in the process of building two 12 inch gauge Garrett Locomotives and is well underway with the frames, cylinders, and a range of other components.

Ken also had on display his own Baldwin Locomotive and the club petrol powered loco he has made.

Overall this was a great night to see machining in progress and excellent display of projects under construction, not to mention much discussion by all.

Many thanks to Ken and his boys for their hospitality.

Meeting closed at 8:50 pm, followed by drinks and a good chat.

Some photos from the night appear below.



Above Left:: The Club Loco with body removed. It only requires some minor finishing-off touches — anyone volunteering to help out?

Above Right: The Club Loco chugs across the workshop floor under its own power. The Honda engine incorporates a centrifugal clutch which automatically engages as the throttle is opened and the engine revs up, giving a very smooth and controlled take-off from standing.

Below Left: Part of the chassis and running gear of Ken's 7¼" Baldwin loco. It includes CNC machined wheels, fabricated cylinder blocks and fully compensated suspension as per the original prototype locos. This is a very serious locomotive!

All photos: Jim Clark

President's Report for April

by Andrew Manning

All of the Society's efforts of late seem to be towards getting the ground level track completed, tidying the grounds for public run days and private birthday functions. Is this why the Society exists? Why you joined us? What has happened to the broader area of model engineering?

The Committee keep saying that no new projects will be undertaken when the GLT is completed, at least not for a while, but little jobs keep appearing. Fences, reticulation, riding cars, maintenance of elevated track, re-decking the overpass etc., all very necessary.

Members, we need more help on site. We will then have time to actively support the broader area of model engineering through an exhibition and organised training and support of novices in our workshop.

Enough of that. Progress can be seen on the ground level track, with the challenge of laying out the curve on the north east corner of the inner circle just about behind

us. The outer loop has been in use for the last two run days and is proving to be an asset moving the waiting passengers. Next run day the station bypass points should be working automatically.

A group of members ran the sausage sizzle at the Hare and Forbes sale at the end of last month. For their efforts the Society has a big tool cabinet in the workshop. Progressively we will improve our selection of tools (but please put tools back at end of each day).

For the last couple of months I have had limited time to devote to NDMES, and that situation will continue until June. I would like to thank Paul James and John Shugg for picking up the load of little jobs, issues and enquiries that seem to occur on a regular basis.

Andrew Manning
President

Bournemouth Club Points (cont)...

by Dave Burman

(Continued from page 1)

The section of the point that bends consists of a 2 m long flexible section, this is made up of two 12mm thick steel strips that carry a steel plate. Attached to the steel plate are a series of specially machined steel sleepers that are able to slide on the plate in a controlled manner.

The sleepers carry rails that are made up of four stainless steel strips that are held with sufficient tension to hold the strips together but also to allow each strip to slide. The strips are about 0.5 m long and are fitted such that the end of each strip is halfway along the adjacent strip. The four strips pinned together constitute one rail.



This construction allows the "rail" to lengthen or shorten as needed as the rail is curved. The above photo shows

the "bendy" part of the point with the 4 segment rails attached to the steel sleepers. The sleeper has a slot: this contains a bolt that secures the sleeper to the steel base plate. The bolt is adjusted such that it holds the sleeper in position but also allows the sleeper to slide when the point is moved. This area requires lubrication to ensure the smooth movement of the sleeper.

The strips were laser cut from 16mm thick 316 stainless steel, ensuring that the strips are consistent and the slots in them for the connecting pins are accurately located.

The points superstructure is fixed to a beam that is mounted on two carrying wheels, these run on steel plates set in the ground that allow easy movement of the point assembly. The holes that can be seen in the track ends line up with a locating pin mounted in the end of the moveable section, this ensures alignment of the point to each of the tracks.

The pin operating mechanism is interlocked with the signalling such that when the pin is withdrawn to allow movement of the point, the appropriate signals are set to danger.

The "bendy" point was developed by the Guildford (this one is in Surrey UK) MES and is in use at a number of tracks. It works well and is reliable. The only problem encountered is when you forget to lubricate the sliding sleepers — if one or more jam you end with a rather strange straight sided curve.

Dave Burman
(more photos on page 4)

Bournemouth Club Points (cont)...

by Dave Burman



Above: Point is aligned to the track from the steaming bay and an engine is running onto the point.

Below: The point is aligned to the spur to enable a riding car to be run onto the main and attached to the engine.

All photos: Dave Burman



Above: A train on the main line passing over the point.

Below: Showing the point "bending" towards the spur track



THE FUTURE OF YOUR NEWSLETTER

Regrettably, this is the first issue where I have had to reduce the number of pages due to lack of content, which means lack of contributions from you, the members. This is a trend which I have noticed has been worsening for some years now, with less and less input received from members, apart from the stalwart few — thanks to John Shugg and Dave Burman in this issue.

So perhaps it's time to think about what you want from your Society's newsletter, or even if you want one at all. Perhaps with the all-pervasive digital media and the Internet, a newsletter in the traditional format like this one is no longer of much interest to you?

Or perhaps it is time for a fresh format, or a different Editor? I really need some direction from you, the silent membership out there, and in particular I need your

input, whether it is in the form of some hand-written notes, some sketches, photos, or even better, an emailed article such as some members can produce. But don't let the lack of a word processor prevent you from submitting something for publication, no matter how it looks on a piece of paper. I am an expert at deciphering scrawly handwriting and fixing dodgy grammar!

So how about jotting down a few words and finding a couple of photos showing your current project? Or write up an article about somewhere you've been? Or a short article on how you solved some workshop problem? I eagerly await your suggestions!

Please email your material to:

jimclark@hardwareandsoftware.com.au

or post c/o Secretary, PO Box 681, Balcatta, WA 6914

What is a "SAFE" Speed for 7¼" Gauge Track? by John Shugg

This article is very relevant in relation to the sobering story on page 6.

N.D.M.E.S. decreed for our Society's written Operating Procedures that 10 kph was to be the absolute maximum speed for passenger operations on our tracks. That needs a heck of a lot of clarification before you believe it, or even try it!

On a curve on our track there **MUST** be a lower speed restriction, and even on a straight section of track, 10 kph can be a frightening speed, especially if you are passing close to obstructions such as trees or fencing on the side of the track. It's the sudden stop that hurts the most when you hit an obstruction.

The radius of our GLT curves (and points) is just 17 metres, in the main, with a far tighter curve in the tunnel, where the **MAXIMUM SPEED** is set at only 4 kph.

Reasons are, in addition to very narrow wall clearances, (1) restricted forward visibility, (2) virtually no super-elevation and (3) no "fettlers-escape" recesses in the walls of the tunnel!

In general our curved track has 3 mm super-elevation, meaning that the outside rail, compared to the inner rail on the curve, is eased higher by 3 mm, after the tangent. The rising transition length over a curve entry (and exit) can be determined mathematically, if you wish.

On a 17 metre radius curve, with a 3 mm super-elevation, the equilibrium speed for that curve is 6 kph.

Equilibrium speed is where the train is "in balance", with no flange bearing on the outer rail, which will happen at a higher speed. It is a "safe speed", since with no outer wheel flange bearing onto the edge of the outer rail of the curve there is very little chance of the wheel flange climbing the rail causing a derailment and a possible roll-over. Passengers feel comfortable at the equilibrium speed, and do not feel the need to lean into the curve nor feel that they will be tossed outwards by excessive centrifugal force.

The formula for superelevation (or cant) is:-

$$E = \frac{WGV^2}{WgR}$$

where: E = Superelevation in millimetres
W = Weight (note the W's cancel out, so weight is irrelevant)
G = Gauge in metres (0.18415 nominal)
V² = Velocity in metres per second
g = Gravity in Newton metres/sec (9.806)
R = Radius in metres

The table below gives track radii. Read down the selected column until the approximate superelevation appears and the equilibrium train speed can be read in the left column. **John Shugg**

EQUILIBRIUM SPEED FOR 7¼" GAUGE TRACK

Radius >			13M	14M	15M	16M	17M	18M	19M	20M
SPEED in kph	↓	Velocity m/sec	SUPERELEVATION (CANT in mm)							
4		1.1111	1.74	1.65	1.54	1.44	1.36	1.29	1.22	1.16
5		1.3888	2.78	2.58	2.41	2.26	2.13	2.01	1.90	1.81
6		1.6666	4.01	3.72	3.47	3.25	3.06	2.89	2.74	2.60
7		1.9444	5.45	5.07	4.73	4.43	4.17	3.95	3.75	3.55
8		2.2222	7.13	6.62	6.17	5.79	5.45	5.14	4.88	4.39
9		2.5000	9.02	8.37	7.82	7.33	6.90	6.51	6.17	5.86
10		2.7777	11.13	10.33	9.64	9.04	8.51	8.04	7.62	7.23
11		3.0555	###	12.51	11.67	10.94	10.30	9.73	9.22	8.78
12		3.3333	---	---	---	---	12.26	11.58	9.7	10.42

Notes: Accuracy to two places is for graphing purposes, not for constructional purposes, where rounding to "practical numbers" i.e. nearest ½ mm (!) is expected.

A doubling of speed quadruples the superelevation needed. A 50% speed increase doubles the super-elevation required, approximately.

Superelevation in excess of 12.7 mm is NOT recommended. A cant in excess of 12.7 mm is dangerous and certainly most uncomfortable for those driving and riding at speeds less than the curve's design requires.



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Tragedy in South Carolina

by John Shugg



On Saturday 19 March 2011 around 1:30 pm an F7 Diesel outline loco "Sparkles" with a 16 inch gauge train operating in Cleveland Park, in Spartanburg County, South Carolina, derailed and overturned with tragic consequences. A 6 year old boy died and 22 others, mostly children, were transferred to local hospitals. Helicopters were used to transfer the more seriously injured people, mainly suffering the result of broken bones and lacerations.

The locomotive and two cars ended up in a rock strewn ravine. Photos posted on Face Book or web sites immediately after the event depicted scenes of the injured receiving first aid. Photos also appeared to show bogies from the passenger cars scattered along the track near the derailment site. The bogies, 600 lbs per car, were critical to the stability of the carriage in keeping its Centre of Gravity low thus helping to keep the car upright. Apparently the bogies were not permanently attached to the carriages and appear to have been detached during the derailment.

The driver, also one of the injured, initially stated to Police that he knew he was going too fast. Some days later he retracted his earlier statement. The safe speed for that railway was considered to be 15mph or 24kph.

The track had been inspected several days before the event, and the train was driven around the circuit three times on the Saturday morning before passengers were

The Loco involved was "Sparkles", so named after a naming competition years ago.

allowed to board the train.

It is easy to speculate as to the cause of the tragedy and we must await the Coroner's findings. The miniature railway fraternity around the world will empathise with the Cleveland Park authorities as they endure their worst nightmares. Enforced closure of the track, imposed pending the Coroner's findings, and the attention of the legal fraternity in suits for damages on behalf of many injured passengers. The railway may never re-open. The loco itself was built around 60 years ago, and had undergone recent overhauls to brakes and engine.

The issues that this accident will raise is a tightening of driver training, proper documentation of that training and licensing, regular inspection of track and rolling stock, maintenance records and a written safety management system available to all staff and the Inspecting Authority.

Did the locomotive have a speedo, an over speed cut-out, was the track geometry itself safe, were the wheels and flanges showing excessive wear and was rail climb a factor? The derailment occurred just after the train completed a left hand curve.

All these CONTROL FACTORS, and more, will impact upon us all in the near future.

John Shugg

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