

**CASTLEDARE
MINIATURE RAILWAYS**

W.A. (INC)
www.castledare.com.au

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Castledare Miniature Railway
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All information on this page ratified by Management Committee on 12th March 2010

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Cover page: Craig and Damelsa's Wedding ceremony

Photographer: D. Edwards

President's Report

Once again it is that time of the month when I get an e-mail from our editor to remind me about this month's C&S contribution. This reminder is totally unnecessary because I never forget that I have to do it, but it does have the effect of making me hit the panic button before its too late ☺.

As now seems to be the case, once again our run day was busy for the first two hours and then dropped away. Unfortunately we had some minor incidents, which was probably due to a combination of confusion and or procedural lapse on the part of the operator. We all sometimes make mistakes and do things in the wrong order and it is compounded by the fact that we only operate once a month and for only a few months of the year. It is also true that these lapses of concentration happen and have happened to all of us over the years and we all do things to the best of our ability and in some areas of the railway's operations there are only a limited number of qualified members. All of these things can at times combine and there have from time to time been occasions when it has been nearly impossible to run. In some areas of the railway's operations maybe a few more members need to be willing to learn and obtain qualifications to spread the load around.

The monthly work Saturday of March 12th saw the same dedicated members turn up with the main work for the day being sleeper replacement from the start of Fisherman's Bend to the end of the cutting. This was the replacement of the last of the wooden sleepers, which I think were about one in four as many had already been replaced in the past five years. I am always continually amazed by the efficiency and speed at which a handful of what I consider skilled members of the track gang, along with other members also helping, manage to make such quick work of this job. Not only do they remove and replace the old sleepers, but also re- ballast and level the section that has been worked on.

Also on the Sunday the same small band of workers turned out to prune the overhanging branches over the power wires and station and other buildings. This was made possible by the use of a cherry picker, which was organised by new member John Palm, which he was able to borrow from his employer Boom Sherrin Plant Hire. Also, Eno had two of his lady SES volunteers along with two extendable chain saws. This work was carried out in an expert manner with no damage to CMR property and also with great speed and safety. This work also saved the railway many thousands of dollars that it would have otherwise cost to have the work done professionally. Many thanks to members and others who made this important job possible. On the same day from 11am until 2pm, member Rod Bradley had a private run for his employer's social club. This was unfortunately poorly attended by other members who were not involved with the tree pruning, even though Ken had asked for people to help with this run the week before. Fortunately Mike Crean had his loco in operation and decided for a change he would run in the opposite direction. I also ran Phoenix, which I ran the week before. As Phoenix had not been run for some time it needed a few laps to blow out some of the cobwebs, but once that was done it performed, as always, with what to me has always been music to my ears, if not shared by those directly behind me heehee. It did however develop a problem with the blower valve so having removed it and made repairs I wanted to see if all was OK so I joined Mike to run in the opposite direction and gave the punters the experience of steam. Due to it still being summer I only ran down through the cutting and then back up over Stanbridge and round the short loop, whereas Mike went out to Wilson.

Running in the opposite direction, especially with steam, makes for a totally different driving experience and both Mike and myself had an enjoyable 4 hrs playing trains. Rod Bradley performed the guard duties for Mike's train, so this shows how short staffed we were!

Over the year the power needs for the railway have grown and this has led to insufficient power for our needs in certain areas. The club also needs RCDs installed to bring us up to present day requirements and safety standards. This work will be carried out by Goreys Electrical, who have done work for the railway in the past and who gave us a very good price. This will certainly give myself, and the committee, peace of mind. Ken was able to obtain the steel needed to make the new T rail for the Fern Road replacement at a very good price and new sleeper material has also been ordered. This steel will need to be rolled before it is welded into T sections, so if members would like to help with this make yourself known to Craig. The new limestone fire access track is now in place at Fern Road and the new track bed has been pegged out. This new form will have a limestone base, which we hope will fix most of the problems that we have had in the past, along with the T rail and bigger sleepers.

Another job that has been done is the Station roof extension on the picnic ground side and new uprights that had rusted away are now in place, so now when you sit on the station seats when it rains you won't get a wet neck. Patrick Constructions who have done work for the railway over the years carried out this work. Like the steam shed doors having this kind of work carried out by contractors allows these jobs to get done while we the members do what we do best, that is maintain the Railway.

Roger Matthews President,
Castledare Miniature Railway



FROM THE SECRETARY'S DESK

Notes from the last Committee Meeting – these are only a brief summary of some of the items discussed.

- Rule book revision – ongoing project
- Ongoing planning re increase carriage shed size – drawings now submitted to SRT and to the City of Canning for preliminary approvals – waiting on engineering approvals – may require some amendment to the plan
- Ballast bin to undergo much-needed refurbishment to ensure continued use. Ballast not to be left stored in it but rather use the ballast bin to simply fill ballast wagons as required.
- Discussion re replacement and / or refurbishment of wooden footbridge and also extension of the picnic grounds – financial support for the project to be sourced
- Dependable has been taken off the roster for a complete service
- 3 gondolas which are currently stored in workshop are to be rebuilt
- Expression of interest form received from AMRA for the 2011 Model Train Show. If you have an interest in public relations and would like to take on the responsibility of organizing a display for Castledare during this show – please contact Ken so that appropriate arrangements can be made
- Work continuing on upgrade to maroon set
- Bi directional run day is to be held on the Sunday 24th July as a charity day for Retina Australia
- Pruning of trees to be carried out in and around the station area on the 13th March [9am start]
- AGM upon us again, this will be held at the ECO centre Wilson on Friday 25th March starting at 6.30pm with a light supper provided.
- Niana Station roof has been enlarged to cover the bench seating along the fence line. The uprights have also been renewed, the steel framework needs to be re painted - any volunteers?

DATES FOR THE DIARY:

Public Run Days

Sunday	3 rd April – Niana Station
Sunday	17 th April – Wilson Station
Sunday	1 st May- Niana Station
Sunday	15 th May—Wilson Station

Work days / nights – all members welcome to participate

Wednesday	23 rd March - Workday
Wednesday	30 th March - Workday
Saturday	2 nd April - Preparation day
Wednesday	6 th April - Workday
Wednesday	13 th April - Workday
Friday	15 th April - Work night

Times for the workdays are as follows:	Wednesday	9am – 3pm - byo lunch
	Saturday	9am – 3pm – byo lunch
	Friday	4pm – 9pm – evening meal provided

Times for workdays are generally flexible – feel free to come when you can and go when you must

General Dates for inclusion in your Diary –

- Friday 25th March – Annual General Meeting to be held at the City of Canning ECO centre at 6.30pm
- Saturday 2nd April – Preparation of the railway + General Meeting at 11.30am
- Friday 8th April – Committee meeting at 5.30pm (this date to be confirmed)

A major tree pruning session in addition to a private party booking was held on Sunday the 13th March. The tree pruning was necessary as a result of safety issues with large branches causing some problems with power lines and such.

As advertised in the last issue of Cinders and Soot a request was made for help on this day in addition to asking for support at the general meeting the week prior. I would like to thank the following members who did take the time to do something extra for their club on that busy day.

Sue Belcher who cooked lunch for the workers, Vic Jones, John Watson, Tom Donkin, Keith Price, Mike Crean, Roger Matthews who were on hand to assist both with the tree pruning and driving the trains as required. Also to Rod Bradley who performed the role of guard inbetween providing assistance to his work colleagues at their function. Also in attendance was Eno using the day to give instruction to members of SES on use of a chainsaw and a non member who made the tree pruning easier. John Palm - Thank you, it sure made getting into the trees easier.

The attendance of some more members would have made the work load considerably lighter for those who regularly carry the can for the club.

2011 ANNUAL GENERAL MEETING:

This year’s AGM will be held on Friday, March 25th at the Eco Centre, Wilson Park commencing at 6.30pm.

Those members of the current Management Committee who are up for and eligible for re-election if so nominated are:

- Vice President Vic Jones
- Secretary Ken Belcher
- Committee Craig Belcher
 Richard Stuart
 John Watson

Nominations have duly been received – results will be announced at the AGM.

Castledare Gallery
◆◆◆Craig & Damelsa's Wedding Day◆◆◆



Ken, Sue and Craig



Craig and Damelsa



Stained glass window in
the church



Craig, Damelsa and Sue



The newly weds



◆◆◆CMR Family Day◆◆◆
(Photographs supplied by – R. Matthews)



Roger and Phoenix in the station



Mike driving past 'C' box in the opposite direction



Mike driving his loco in the opposite direction

TRAIN DYNAMICS – SOME SHORT LESSONS

Part 1- Stability & Speed

The name Castledare Miniature Railway (CMR) says it all, it is a miniature railway, not a fun park, and is operated along the lines of its full sized brothers by dedicated amateurs with professional guidance as an extension of their hobby and pleasure. Due to many events around the world, serious derailments, privatisation, fairground accidents etc there has evolved a focus on safety and the now necessary insurance. Operators like Rio Tinto in the Pilbara have even moved away from “quality control” to a system based on “safety principles”. CMR as a pure passenger hauler has to focus on safety.

There are many myths around along with thoughts that miniature rail is different and special allowances and deviations have to be made to make things work or one could say “to keep on the track”. However, no matter what the gauge of a railway, the laws of physics and the resultant dynamics from motion apply. Just as important it is necessary to understand why certain items were designed and that departure from the principles involved will compromise performance and safety.

The advent of the 2nd World War started a number of changes that affected train dynamics; the development of mainline dieselisation in the United States, the removal of the spring plank to create the “three-piece” (3-P) freight bogie, change to roller bearings and long welded rail. By the early 1970s these changes were complete and then in what was the “norm”, un-explained derailments were growing. The Association of American Railroads set up a program under Ed Lind from Southern Pacific to lead the teams to obtain a better understanding of track-train dynamics. The outcomes have been followed, particularly in Australia and China and have been integrated into operation and design practices. As mentioned in a prior paragraph, gauge differences do not change the laws of physics or motion, however, wheel diameters change and then so does the critical speed, but gauge does change centre of gravity (C of G) and thus stability laterally.

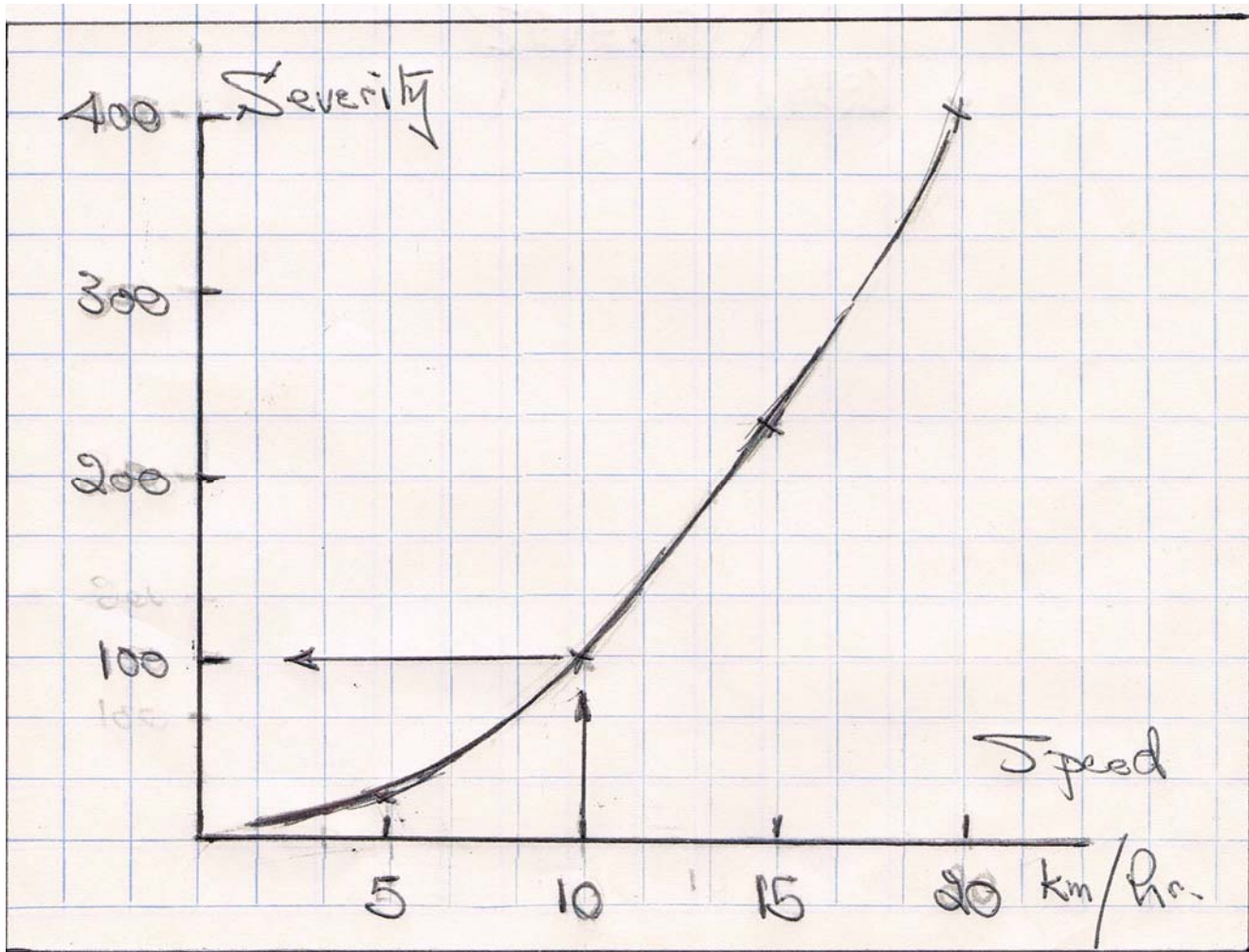
Let us look at **stability**. The allowable C of G for general running of trains is set at 1.75 times the gauge. This is 98inches (rounded to 2.500m) above rail for standard gauge, 72inches for 3feet 6inch gauge and only 12.68inches (332.25mm) for CMR. The figure of 1.75 was well tested in the 1930s by South African Railways in field tests that resulted in the magnificent 16E steam engine that Johnny Wakefield runs in South Australia in model form.

The C of G as shown above will be exceeded on the CMR, not by much and certainly not doubled as thankfully most of our body mass is in the buttocks and legs and when sitting down our own C of G is below the hip bones, and just like our full sized brothers, measures are set in place to mitigate the chances of rolling over off the track. In practice, if the track is in good condition and the load restrained, then a speed restriction is applied. The old WAGR applied a lower C of G limit at 69inches for tank wagons. One can imagine the worst-case scenario on CMR with passengers standing in a stationary train. This is OK until the train moves and provided they were steady you could push them along at the loading area very slowly, but you could not haul them around even at 4km/hr! The old WAGR often shifted large items from Kalgoorlie to Perth where there was C of G exceedance. Normally passenger and bogie freight stock would run at 80km/hr. The trains were run at 50km/hr. Hence it becomes necessary for CMR to take action to mitigate the chances of an un-stable situation. Speed will be discussed later.

CMR is a little more broad-minded than some clubs and is not adamant about lateral seats in gondolas or straddle type passenger vehicles. The control of the old gluteus maximus becomes important and hence the fitting of longitudinal seats in a gondola is a very good compromise. This keeps the load central. Just in case you haven't noticed, bums are getting bigger. Then there are the station announcements regarding movement not to be under-taken whilst the train is in motion or to stand up! The use of articulation is also another measure where other vehicles in the consist are used to steady another should one be disturbed.

Articulation brings about other issues such as heavy axle loads and track damage. The use of bogie mounted couplers and the positioning of side-bearers will be discussed in another chapter. However, we should understand speed.

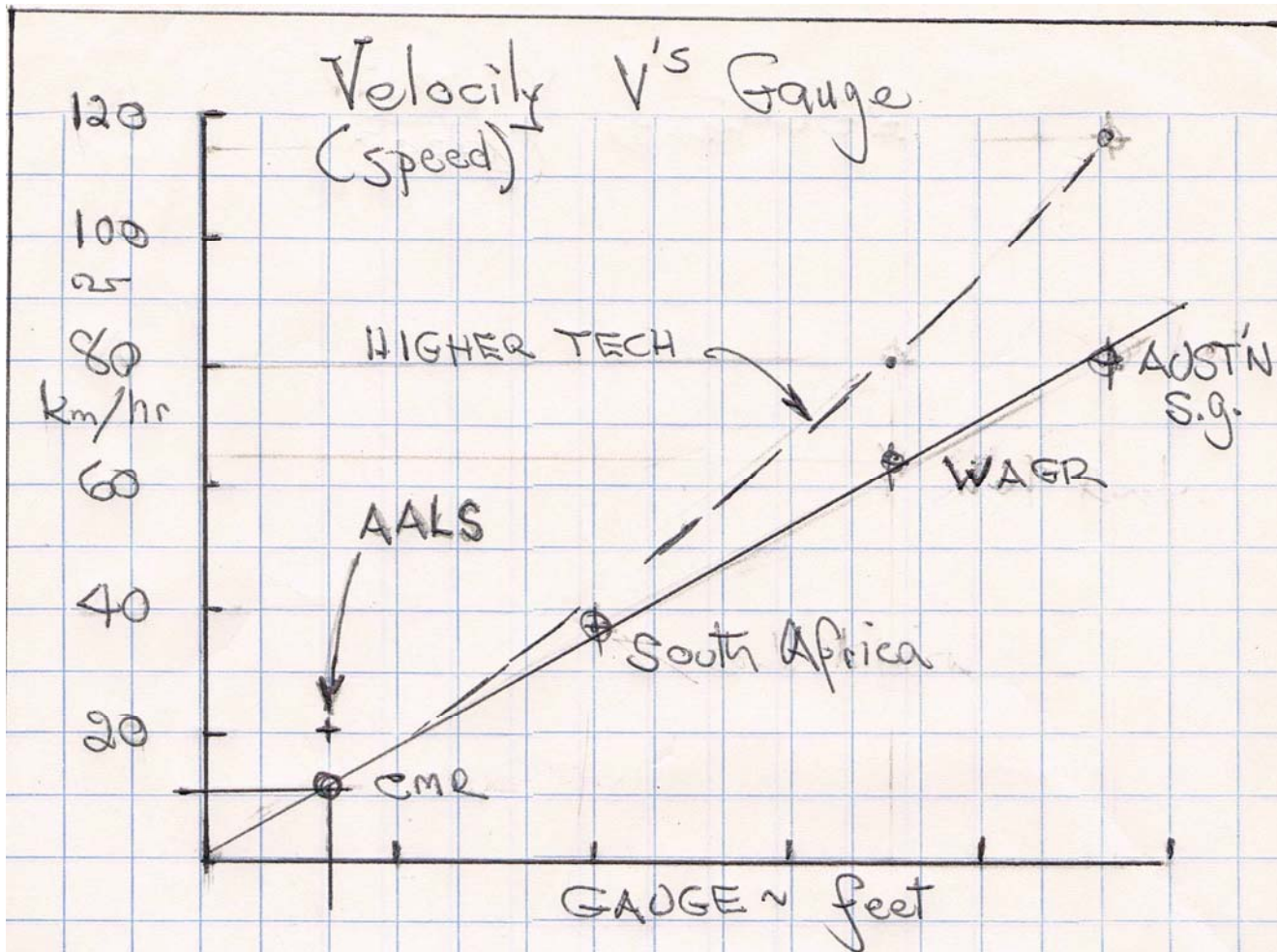
Let us look more closely at **speed**. Speed kills is an old adage pushed on us re road safety. Speed does not kill. It is more like the sudden stop from high speed or the severity of the stop. Speed is velocity and it is velocity squared that determines impact forces and stop distances. This can be illustrated as “severity” in the following graph where a doubling of velocity quadruples the severity. In CMR terms, the change from 10km/hr to just over 12km/hr is a 50% increase in severity.



Wheel sets have a sinusoidal wavelength of motion based on diameter and gauge. This is brought about by wheel treads having a taper or conical profile that helps to take curves without flange contact but importantly helps the wheel set find its running centre on the rails as the diameters on the same axle are never identical. The wheel-sets actually meander along the track.

That is, the wheel set actually “hunts” from side to side to find where it should run. Naturally, a little track gauge variation can make things a much more lively. A single CMR wheel-set has a wavelength when new of some 8 to 9 feet but when restrained by placing a pair into a bogie this wavelength can double. Then, as the treads commence to wear hollowish, the effective conicity increases and the wavelength becomes shorter. Some restraint to this motion is added by having friction at the bogie centre plate and this helps further by adding load. CMR has to consider this latter point as there is a tendency to have roller bearing support. From all of this there is a resonant speed pending bogie centres, body length and torsional rigidity etc. This places the resonant speed at CMR as high as 14 to 15km/hr and as low as 8 to 9km/hr if really badly worn, and thus a speed of 10km/hr with a limit for over-run of 12km/hr would be a good compromise. If you have some doubt to what is being said then take a HORNBY OO 2 x axle wagon and push it gently along a piece of nickel-silver straight track and watch the free end wobbling!

The following graph illustrates speeds for low technology trains into which CMR fits. Higher speeds can be achieved by adding restraint devices such as longitudinal dampers and constant contact resilient side bearers but new problems can be introduced such as the ability to absorb track twist etc. The graph also illustrates the impractical and dangerous 20km/hr shown in the AALS Standards.



Closure. This short paper is written to show that speed restraint is paramount and it has to be remembered the powerful CMR locomotives can easily get away. It will be shown in following articles that couplings and train handling then become an issue when throttling back or braking just as "discovered" for the full sized stuff by the studies conducted as mentioned early in this paper. Hopefully we can connect those points mentioned in the third opening paragraph as they are very applicable to CMR. However, in these days of litigation and safety it is well worth spending \$29 and to fit a speedometer to your locomotive and an over-speed cut-out for the powerful diesel types just like their full sized brothers.

BRIEF CV - Les Smith

Les Smith has agreed to put together a few articles that are pertinent to CMR's operations. Les was visiting CMR back in the early 1960s from his connections with Jack Stanbridge and work-mate Ed Brown from Midland Workshops. From an apprentice on steam Les worked through the then design office on rolling stock design and testing. On the way to becoming the Chief Mechanical Engineer of ANR he gained experience as the Railway Technical Superintendent for Hamersley Iron, R & D Engineer at ALCO Engines (USA) and Asst Gen Manager Westinghouse Air Brake Aust. In the final years of ANR as NRC took over, Les worked as Executive Engineer for the Director and GM. The manual produced in 1989 at his instigation for Railways of Australia (Rolling-stock Standards and Recommended Practices) marked the commencement of true co-ordination (mechanical) between the States. This backed-up the introduction of articulated wagons, double stack well sets, double deck cattle wagons, RoadRailers and the EL, AN, CLP locomotives etc. He represented the Commonwealth Govt on committees developing new standards for safety for privatisation of the rail network. As a consultant from 1994 he introduced Chicago Freight Car Leasing to Australia and in 1998 over-saw the design and building of Chinese wagons for Australia. Just to keep busy he has a number of patents and has been an independent investigator for the Australian Transport Safety Bureau. After 55 years with the big train sets it is now time to relax with their smaller brothers apart from the occasional presentation at International conferences.

Notice Board

For Sale

71/4 Black 5 chassis, complete and working on air. Tender almost complete. Copper boiler, silver soldered by Bob Brown and pressure tested certified.

Reason for sale, failing strength and health! Buyer collects.

Can be inspected at:

4, Glenelg Way, Mandurah.

Telephone: 9582 0334. Cliff Pole

Price: \$25,000.00

For Sale – CMR DVD and CMR logo sew-on patches

Don Bowyer was commissioned to put together a CMR DVD depicting our history as well as some current footage. He has done an extremely professional job and the first batch of DVDs sold out quickly. A second batch is now on sale and can be purchased from the Canteen at \$5 each.

CMR logo sew-on patches are also available from the Canteen at \$5 each.

Private Parties

Please note that Private parties, held on Public run days, MUST operate from the designated station of the day.

Security

Members are reminded not to leave valuables on display in parked cars. Vehicles parked on the top car park have been broken into.

MESSAGE FROM THE EDITOR

Please do not forget to advise the editor if you change your email address, or home address. This will ensure that you always receive your Cinders and Soot notification, or 'snail mail' copy. Thank you.

If you wish to contribute an article to Cinders and Soot, please note that the closing date is the 15th of each month. Please send your contributions to Trish Stuart at the email address on the page 2.
