NEWSLETTER No 6/2005

Railway Technical Society of Australasia
SA Chapter
Engineering House, Bagot Street
NORTH ADELAIDE SA 5006

JULY 2005

NEXT MEETING

The next meeting will be held on

THURSDAY 4th AUGUST AT BAGOT ST, NORTH ADELAIDE (Institution of Engineers) - at 17:30.

Topic:

Highlights of the 8th International Heavy Haul Conference

Robert Schweiger

Rob Schweiger was able to attend the 8th International Heavy Haul Conference held in June in Brazil. Rob will talk about the conference and about the many of the railway engineering developments that have been developed over the past few years. Rob advises that his talk will cover:

i) Overview of the Conference
ii) Review of Technical Papers:
   a. Common Elements of Successful Heavy Haul Railways: A Worldwide Perspective.
   b. Top of Rail Friction Control
   c. The effects of short-term post-weld heat treatments on residual stresses in flash butt welds
   d. Rail Requirements for 40 Tonne Axle Loads
   e. Track Condition Monitoring: The next generation

CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD)

IEAust members are reminded that attendance at RTSA technical meetings contribute towards CPD requirements. Each RTSA technical meeting generally has a value of 1 CPD point.

LAST MEETING

At the last meeting, Dean Phillips, Fleet Services Manager – TransAdelaide, spoke about the contract maintenance of TransAdelaide's railcars, the lessons learned from the first railcar maintenance contract and how these were incorporated into the tender for the second contract. A summary of Dean's paper follows:

RE-TENDERING OF TRANSADELAIDE'S RAILCAR MAINTENANCE CONTRACT

Dean Phillips]
Fleet Services Manager
TransAdelaide

Background

Prior to April 2000 TransAdelaide did Railcar Maintenance In-House. The cost of railcar maintenance in 1998/99 was $6.35m. TransAdelaide had a 'negotiated contract' with the government to operate the Adelaide rail system but were under pressure from the government to demonstrate that they were competitive. In 1999 TransAdelaide decided to tender out Railcar Maintenance. An In-House bid was permitted, however it was unsuccessful and United Goninan were selected as the successful tenderer.

The United Goninan Contract

The United Goninan contract pricing structure was as follows:

i) Planned Preventative Maintenance – Fixed Price
ii) Unplanned Corrective Maintenance – Labour Rate
iii) Planned Component Maintenance – Price Schedule

As a result of contracting out its railcar maintenance, TransAdelaide were anticipating a reduction in maintenance costs and an improvement in fleet reliability, availability and cleanliness. This did not occur.

What happened? The cost of railcar maintenance for the first full financial year under the contract (2000/2001) was $7.96m which exceeded TA's expectations. The reliability of the railcar fleet reduced significantly and reported railcar faults doubled. The availability of the railcar fleet reduced due to very long turnaround times on the 2000 class bogie overhauls.

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Why did it happen? There was insufficient incentive in the Key Performance Indicators (KPI's) to control the volume of Unplanned Corrective Maintenance work. The work scopes in the contract for the overhaul of the major components were too brief resulting in extra costs being charged against the contract price for a standard overhaul. The Planned Preventative Maintenance work was performed primarily by apprentices and unskilled labour.

Outcomes from the United Goninan Contract

The contract with United Goninan was fixed for 3 years with provision for annual renewals thereafter. After 3 years the KPI's were altered putting more emphasis on Reliability, Availability and Cleanliness.

During the 4th year of the contract, TransAdelaide decided to re-tender so that a new maintenance contract could facilitate an improvement in the Reliability, Availability and Cleanliness of the railcar fleet.

The Bombardier Contract

Bombardier Transportation (BT) were the successful tenderer. The Contract is for a 10-year period.

The Contract Structure is based on a:

i) Fixed Price per kilometre for each type of railcar for a set base fleet kilometres - +/- 5%.
ii) Fixed Management Fee

Railcar Maintenance and Related Services

The Kilometre rate is inclusive of:

i) Railcar Preventative and Breakdown Maintenance
ii) Major Component Overhauls
iii) Component Obsolescence
iv) Minor Graffiti and Vandalism
v) Railcar cleaning
vi) Ensuring Railcar Asset Condition improves over term of Agreement
vii) Marshalling and Stabling at the Railcar Depot

Extra service kilometres will generate extra costs to TransAdelaide. Consist planning is vital as different classes of railcar attract a different km rate:

i) A 2000 class railcar - $4.07 per kilometre
ii) A 2100 class railcar - $1.58 per kilometre
iii) A 3000 class railcar - $0.81 per kilometre
iv) A 3100 set (2 car consist) – $1.54 per kilometre

Distance travelled will be managed through Fuelscan.

TransAdelaide will be invoiced on a Fee-for-Service Basis for Major Graffiti and Vandalism and Re-Railing Services. BT have entire responsibility for Railcar Maintenance and Performance, including issues of obsolescence. BT have the first opportunity to bid for additional work i.e. major railcar refurbishment. BT will lease the Railcar Depot and Facilities.

There will be Annual Asset Condition Scores established for each railcar. There is provision in the agreement for the replacement of all air compressors on 3000 / 3100 Class railcars.

The contract with BT is based on three KPI's:

i) Availability - Based on 86 railcars and correct mix
ii) Cleanliness
iii) Reliability

In relation to the last KPI, there is a three-month moratorium for penalty payments from the start of Agreement.

All of the in-traffic penalties due to railcar faults will be passed on to BT. There is no bonus scheme. A Daily Performance Snapshot will be established to monitor contract performance.

BT will be given first right for the quoting on all railcar upgrade, collision, or other work.

Refuelling arrangements for railcars will continue to be done by TransAdelaide staff.

BT to have a 24 hr Help Desk, must be Quality Certified and must obtain Rail Safety Accreditation.

Contract Mobilisation

The Maintenance Contract start date was 11 June 2005.

Key Issues were:

i) BT mobilisation plan was hindered due to limited site access
ii) BT Contract Manager appointed – Mr Dave Carlton
iii) BT meetings were held with Unions pre contract start.
iv) BT interviewed UG employees and offered positions before contract start date.
v) One of two key UG employees were engaged by BT before contract start start date.
vi) TA to undertook internal key staff briefings and established internal KPIs.

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vii) Joint workshop was held between TA and BT to document interface procedures.
viii) BT and TA have met with Rail Safety Regulator regarding BT Accreditation.

2005 EMINENT SPEAKER TOUR

Dr Hugh Hunt is the 2005 Railway Engineering Eminent Speaker. Dr Hunt is coming to Adelaide and will present his paper as follows:

Date: **Thursday 25th August 2005**.

Time: **5.30pm for 6.00pm Start of Presentation**

Location: **IEAust Building, Bagot Street North Adelaide**

Topic: **"Vibration from Underground Railways"**

Dr Hunt is a lecturer at Cambridge University where he has the divided interests of studying dynamical systems and the education of engineers in the design of dynamical systems. He has received substantial grants for the study of existing rail systems and the design of new ones. The work of his research group is focused on developing methods for reducing noise and vibration generated by railway trains, especially in underground tunnels. The project involves analytical and numerical modeling of the track and tunnel and their interaction with the ground. The project is of considerable interest to all urban railway operators in Europe and elsewhere.

SOUTH AUSTRALIA INFRASTRUCTURE REPORT CARD FOR 2005

The South Australia Infrastructure Report Card will be released on Monday 22nd August at a special lunchtime function to be held at the Hyatt Regency Ballroom and organised by the Institution of Engineers – Refer separate brochure.

The South Australian Section of the RTSA is planning to attend and is proposing to book a table. If members would like to attend the launch of the Infrastructure Report Card as part of the RTSA group, please contact Robert Schweiger on 0413 128 775 or by email at robert.schweiger@jhg.com.au.

A VIEW FROM AFAR - by Max Michell

From time to time something happens to remind you of the progress that has been made over the last half-century or so, and in so doing to re-awaken the range of opportunities that lie ahead for the future. One such occasion was recently when I was at Sutherland, junction for Cronulla on the line to Wollongong, waiting for a train back to the City. The next train indicator on the opposite platform indicated the next train was not stopping ('remain behind the yellow line at all times'). There is no such thing as a non-stopping passenger train at Sutherland, so I was naturally curious as to the identity of the approaching 'express'. It turned out to be a 4500 tonne loaded coal train, with four 82 Class locos (3000 hp each) slowly grinding its way up the 1 in 40 grade into the station. The wagons all grossed out at 100 tonnes – 25 tonne axle load while the train was around 840 metres in length. Which set me to thinking – 50 years ago there were many more freight trains on this line (and fewer passenger trains it should be noted) and all but a very few would have been steam hauled. The maximum loads, with combinations involving the biggest steam locos in NSW, were less than 1000 tonnes and involved wagons that rarely would have exceeded 16 tonnes axle loading. Train lengths were limited to around 400 metres, as much by refuge loops and sidings as by the train technology itself, and that number was a function of the distance able to be worked from a central manual signal box.

So in one small example there was a display of progress in locomotive, wagon and track capability and by implication signalling technology and communications (remember the 'not stopping' indicator). A little earlier a freight train in the opposite direction had a load of gravel heading for the concrete mixers of Sydney. These wagons grossed at 92 tonnes but in fact were just over 20 tonnes tare – which is a function of their heritage as former narrow gauge coal hoppers built for the opening of the 'new' Moura route in Central Queensland around 1970. In this instance we have a very interesting view of the gauge issue in this country – while there are still breaks of gauge their impact is diminished by changes in freight handling, while there has been a steady trade in locomotives and wagons between standard/broad gauge and narrow gauge and vice versa, enabling the recent phenomenon of privatisation and leasing to take root more effectively. While ex Queensland coal hoppers can be found in three hauls in NSW, a number of NSW short flat wagons have recently been shipped off to Tasmania to fill a void for container capacity there. A number of ex Queensland locomotives are running in Tasmania, and now there are locomotives from the same class operating in NSW on standard gauge. In Adelaide the locomotives employed on the Bowmans shuttle are former narrow gauge units from WA. And so it goes; events that would have been regarded as improbable or impossible 50 years ago (or even as recently as 15 years ago) are now accepted as quite normal.

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There is so much that has changed in the last half century that trying to even list the major issues would be well nigh impossible. Issues of gauge, technology, capacity, ownership, regulatory, financial and so on would provide some sort of umbrella under which a whole raft of significances could be found. But it would seem that the past is really only useful if it is used to provide some pointer to the future.

So I thought I would pick up on a few that in my mind are big issues for rail.

There have been some very significant changes over the last two decades, but in almost every case the speed of decision making and implementation has been slow. In many cases there have been institutional or political issues outside control of the rail industry, but there have been just as many where the industry, or sections of it, has been the root cause of slowness. Look at the recent record of Freight Australia in confounding just about every worthwhile development that might have happened on its patch, or RIC where all sorts of grand plans came to very little real action. There is a need for the rail industry to get a culture of 'can do' well and truly implanted so that every opportunity can be turned to advantage – to be able to take concepts to plans to action in much shorter order than in the past. The current round of investment on the east coast by ARTC will be the most obvious and immediate test on this issue.

Over the years rail has developed an abhorrence of sidings to the extent that in most places there are little more than train load terminals to handle the interface between rail and their customers. This has had the dual effect of interposing road operators between the rail system and its customers, while at the same time introducing a range of access and throughput issues to do with large single terminals. There are signs that this issue is beginning to be understood by both the industry and governments, although it is apparent that ownership or otherwise of terminals is the major determinant of individual attitudes by rail operators. There is a real need for more efficient access to and operation of terminals, and to selectively re-introduce sidings where viable less than trainload lots can be assembled directly by the customer. There is little point in an open access rail network if access to and from the network is largely in the hands of individual organisations with limited interest in competitive access. At the same time it makes no sense to be paying for inefficient terminal handling in addition to a road haul where efficient direct rail siding access can be more cost effective and enable a closer and more productive relationship between rail and its customers.

As Philip Laird never stops reminding us there are significant impediments to good train running arising from the archaic alignments inherited from the past. In my view this is more than simply alignment – it also involves developing the concept of 'smooth running' across complete routes. As an instance of a 'lower level' smooth running issue close to (my) home the Illawarra Main line between Sydney and Hurstville has two major electric train flows – all Illawarra suburban trains running to/from the eastern suburbs line and all South Coast interurban services. Suburban services run at between 5 and 10 minute frequencies and all are required to join the Main via a 25 km/h double track junction at Erskineville. Interurban trains which run at between 15 and 60 minute intervals from Sydney ('steam station') using the amazing 9 track fly-under at Redfern and join the main at a 25 km/h (but seemingly now 15 km/h?) turnout there. So virtually all trains using the Main Illawarra line need to negotiate 25 km/h high maintenance junctions while a few peak hour trains get the benefit of a straight through route. Not conducive to good running. There are signs that both alignment and the localised speed impact issues are beginning to be understood. In the Hunter Valley 1:18 swing nose turnouts (nominal diverge speed 75 or 80 km/h) are now regarded as 'standard', as much for their reduced maintenance as for their speed capabilities. ARTC are proposing that their Southern line (or North East line if you are Victorian) passing lanes will all have 80 km/h entry turnouts, while installation of similar equipment will be extended in the Hunter Valley. At the same time ARTC are to investigate alternatives to the existing savage grade over the Liverpool Range at Ardglen, and have flagged future North – South corridor alignment improvements in the follow up to initial improvement investment on that corridor.

Right now there are opportunities for rail to pick up on these issues (and many others) as part of the apparent revival of the fortunes of the industry. But it will only happen if we remain aware of the bigger picture while dealing with the details, and just every so often switch back to history to remind ourselves of some of the things that we really need to escape from.

LETTERS TO THE EDITOR

TRACKWORK IN SYDNEY 1

There is always a great deal of pleasure in reading the musings of the indefatigable Max in your Newsletter. Even though we are now separated by a considerable distance, he still provides us with much food for thought. His contribution to the Newsletter No 5/2005 shows us how time and location change our attitudes to many

aspects of the workings of railways and other features of living in a local society.

In his "View from Afar", Max referred to 'possessions'. At first, it was thought that Max was referring to the things owned by society, but as the view was expounded it was revealed that Max was writing about what used to be called ‘occupation’ of a railway track in order to make some alteration or repair to the track. So we have different terms for the same thing. It certainly makes the changing colonial customs and languages interesting and, at times, frustrating. Even so, we live with it and remain friends and citizens within the same Commonwealth.

There is no doubt that customs and habits change over time and the attitudes toward track possessions have changed. In this writer's schooldays and the early part of his railway engineering career, track possession was viewed as the way of last resort. It was often stressed that "a track man's first duty was to keep the funnel running in the five foot". He was a broad gauge man, of course, in those days just before and after WW2. It was then customary to carry out major track renewals and alterations under traffic without delaying trains except for a temporary speed restriction over the site. The same applied for bridge renewals and reconstructions. In the suburban area the off-peak headway was as low as seven minutes on some of the lines and new points and crossing work was done under traffic. One has memories, to one's embarrassment, of being hailed vocally and asked if 1 would mind if I moved my theodolite and my body from the track so that the speaker could take his train along the track to Richmond as he had a timetable to keep. He had brought the train up to about ten feet from me and stopped before speaking to me. He could have blasted me with the whistle but was much more polite. The track force appreciated the spectacle, but I was feeling more than somewhat awkward. Even the Tramways Board showed the same attitude to its services and completely rebuilt, in concrete to street surface, the four crossing and the single left turn tracks at the intersection of Swanston and Flinders Street Melbourne between the last tram on a Saturday night and the first tram on the Sunday morning without delaying the service.

As late as the 1950s the timber decks on the bridges between Broadmeadows and Wodonga on the broad gauge line were replaced in reinforced concrete cast in situ under traffic. So it was surprising to note in the 1970s in Adelaide that other road traffic in South Terrace was restricted to one direction only for several weeks to enable the rails to be replaced on the Glenelg tram track across the terrace at King William Street! As a road user at that time, I could but wonder. The next shock as a pedestrian, was to be confronted by a sign instructing me to use the other footpath because a new building was to be built on the adjoining land on that side of the road. A few years later it became even more surprising. Not only the sidewalk footpath was required, but also the road traffic lane of the carriageway was closed as a building was erected. Property other than the building's allotment was taken. over by the paraphernalia associated with the works. Construction managers and planners seemed to have become somewhat careless with other agencies' property and services.

What has brought about this change of attitude? Surely it is not just laziness or ignorance on the part of the designers, managers and planners. The size and capacity of mechanical plant and equipment may have something to do with it. In the railways case, the advent of modern track structures and mechanised maintenance equipment has made a huge difference. We no longer use hand-held beater picks to pack the ballast in a new track, we prefer to use on-track machines to consolidate the ballast and to bring the track up to line and level. On rural tracks, the times available for possession of the track may allow the on-track machines time to do some useful work, but on the busier suburban lines the services are so frequent that off-track machines have to be used and spot tamping and repairing instituted if the tracks are to be available for traffic. Any major lift and line work using heavier on-track gear would need to be done under possession.

I suppose that I am saying that the modern use of the higher capacity heavy equipment has made it more financially rewarding to work under possession compared with the old methods associated with timber-sleepered tracks. Even the traditional track repairs are being supplemented with mechanical power-operated equipment on heritage railways such as the Pichi Richi Railway. Many of the old handicrafts are being surpassed but not forgotten.

Changes will continue and Max and the present trackmen and women will similarly have cause to "look back and forgetfully wonder" as the song says.

Yours faithfully,

Ieuan D Richards

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TRACKWORK IN SYDNEY 2

Max Michell's 'A View from Afar' in the June Newsletter made for interesting reading. As a transport consultant with 17 years experience dealing with the Sydney public transport system, I too am puzzled by the endless trackwork shutdowns of the suburban rail network.

What began in the post-Granville disaster era to "fix 10 years of neglect" (as I recall the billboards used to say) has itself taken more than 25 years, and shows no sign of ever ending. Meanwhile, terminology such as 'track upgrading' has given way to 'trackwork', lest anyone think that we might finish up with track that was actually 'upgraded' (better, faster, less prone to failure) at the end of all this commuting pain.

From 1 July 2003 a new trackwork system was introduced which allegedly reduced the extent of passenger disruption by concentrating resources into long closures less often. However in practice the hapless commuters are still regularly disrupted, even more so than before if their line is affected by more than one trackwork 'zone'.

For example in the past 12 months Inner West trains were replaced by buses on 14 weekends, Penrith line passengers encountered buses somewhere along their trek to the City on 17 weekends, and the Airport line, only built 5 years ago, was closed for 7 weekends.

Under the new trackwork system lines such as the Illawarra quad (4 track from Sydenham to Hurstville), which was previously rarely ever fully, closed, now shuts totally for 4 weekends per year. Then on top of this, during the July school holidays two tracks of this same quad were closed for 14 days straight, a technique also regularly used on the Western line, even during school term there.

Is there a better way? Of course!

One only has to look interstate to see how things can be done. I regularly observe the QR CityTrain website and I have found that the extent of weekend bussing is markedly lower than in Sydney.

For example in the past 12 months the Ferny Grove line was replaced by buses on only two weekends, as was the Shorncliffe line and then, only from Northgate. On the Cleveland line, full weekend bussing occurred on just one occasion and even this was only between Cannon Hill and Cleveland. The Airport line is never closed, and no full weekend bussing was detected on the Petrie / Caboolture line either.

A similar situation arises in Melbourne, where very little trackwork results in passengers actually being bussed or disrupted. The Spencer Street Station upgrade is taking its toll, of course, but this is a specific project with a definite finishing date.

In order to gain an overseas perspective on the disruption caused to passengers by trackwork I recently contacted 11 international systems, comprising MARTA (Atlanta), MBTA (Boston), Los Angeles Metropolitan Transportation, MTA (New York), Washington DC Metro, S-Bahn (Berlin), Metrô de São Paulo (Brazil), SBB (Swiss Federal Railways), KCR East Rail (Hong Kong), MTR (Hong Kong) and SMRT (Singapore).

It was clear that **none** of the systems surveyed undertook trackwork with anything like the disruption that RailCorp causes to its' passengers. The use of RailCorp-style regular major closures of entire lines, involving large scale bussing, was not found on any of the systems studied.

Most of these other systems do their regular trackwork at night, when no trains operate, either exclusively at night or in conjunction with some trackwork during service hours by the use of single line working or partial closure of multiple track sections.

Whereas RailCorp plans regular total shutdowns of each line for at least 4 weekends per year (often more) as a way of undertaking routine maintenance, other systems use such disruptive methods only as a last resort for major projects that cannot be completed any other way.

Where bussing is used by other systems, it tends to be resorted to infrequently for irregular major jobs, and only over short sections of track, using what the Americans call a 'bus bridge' to link with trains operating up to either side of the closure.

Some interesting examples of the responses received during my research included:

- In New York only 5% of weekend closures require a bus substitution, and then only over a short section of track;
- Washington DC operates trains on 12 minute frequencies in both directions through single line working;
- When a shutdown occurs in Boston on weekends, trains resume at 12 noon;

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- On the Metrô de São Paulo (Brazil) buses are used once every four years;
- KCR East Rail and MTR Hong Kong never interrupt passenger service.

I am mystified why RailCorp does not undertake more of its trackwork between midnight and dawn when no trains operate, and when passengers already use the Nightride bus network provided.

I have heard reasons such as 'disruptions to freight trains' and 'noise complaints from residents'. However many of Sydney's lines do not carry freight trains, and quite a few lines are remote from residential areas or are underground, so clearly there is potential to do better.

There is also greater scope in Sydney to undertake trackwork using single line working, as is already often done (alongside live electric wires) on the Newcastle line.

The CityRail network has many examples where trains can travel to and from the City by a choice of routes, so it would be quite feasible to under trackwork on one short section of track, run trains on the other track and only 'bus' passengers in the direction of the closed track.

For example if the Up line was closed between Fairfield and Granville, Down trains from the City to Liverpool could still operate as normal via Granville, and on their return be diverted via Regents Park. Buses could provide a one-way replacement service from Liverpool to Granville only, which immediately reduces passenger inconvenience by 50%, because only passengers travelling in one direction would be affected.

I think it would be an interesting study to examine why RailCorp trackwork is presently undertaken in such a disruptive manner, rather than by adopting methods used by other systems that purposely minimise the disruption to passengers.

Glen E Hunter
Director
Hunter Transport Consulting Pty Ltd

MEETINGS FOR 2005

Future Speakers/Dates/Topics				
Date	**Speaker**	**Organisation**	**Topic**	**Venue**
04/08/05	Rob Schweiger	RTSA	Review of Heavy Haul Conference-Brazil	Engineers Australia Chapman Hall
25/08/05	Dr Hugh Hunt	2005 Railway Engineering Eminent Speaker	Vibration from Underground Railways	Engineers Australia Chapman Hall
01/09/05 (joint PWI)	TBA	TBA	Upgrading of Glenelg Tram Infrastructure	Engineers Australia Chapman Hall
06/10/05	Dean Lambert	Trans Adelaide	New Trans Adelaide Trams	Engineers Australia Chapman Hall (RTSA to host)
27/10/2005	Railway Quiz Night	PWI	Open to RTSA members	Riviera Motel and Function Centre
03/11/05	George Erdos Alistair Morrison	TransAdelaide (Introduction) Alstom / United (Technical Presentation)	Joint Meeting IRSE & RTSA New CTC System for TransAdelaide	Riviera Motel and Function Centre Site Visit to TransAdelaide Control Centre
29/11/05	Annual General Meeting of RTSA - SA Chapter		Dinner meeting	

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NOTICE TO MEMBERS RECEIVING RTSA NEWSLETTER BY EMAIL

Members receiving this Newsletter by email should note that all Newsletters will be sent in a PDF format prepared using Adobe Acrobat Version 6. To ensure that the Newsletter is decoded correctly it is recommended that members update their copy of Adobe Acrobat Reader to Version 6.

KEY RTSA CHAPTER COMMITTEE CONTACTS

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Articles or editorial comment for Newsletter are very welcome. We have over 100 members locally some of whom will have stories, events or developments of interest that could be reported in Newsletter.

Part of the function of RTSA is to keep members in touch with what is going on in the industry and with each other and to that end we are only too happy to publish items of interest.

Send copy to the Editor, Stephen Townsend at st771048@bigpond.net.au or fax to 08 8218 4327.

Electronic despatch of Newsletter is undertaken by Malcolm Menadue – contact Malcolm on mmenadue@ozemail.com.au if you have any problems receiving Newsletter electronically or in hard copy. Note that electronic subscribers will get their Newsletters and flyers as soon as the editorial stuff is done, while the hard copy mail will of course be some days slower.

For all other matters relating to RTSA SA Chapter contact Robert Schweiger (Chairman) at e-mail robert.schweiger@jhg.com.au or by phone on: 0413 128 775.