

# THE COMMUNICATION CORD



## 60163 TORNADO

New Steam for the Main Line

No. 29 Winter 2013

Covenantors stand on the Didcot turntable with newly re-liveried A1 60163 Tornado, 25th November 2012.



## RHAPSODY IN BLUE!

### ENGINEERING UPDATE *By David Elliott*

Following the first phase of the annual maintenance carried out in October/ November the locomotive continued to perform well other than some problems with air pumps. At the beginning of January the main annual maintenance work has started.

#### First phase of annual maintenance

A complete set of new superheater elements was fitted by David Wright's Locomotive Maintenance Services team. This involved re-cutting a total of 86 countersunk seats in the superheater header, two for each of the 43 elements. This is made harder by the seats all being on the underside to the header requiring the magnetic drill to be used upside down,

which combined with being inside the smokebox was an uncomfortable task. Interfleet fitted the new GSMR radio system which will become mandatory in 2013.

#### Modifications

Chime whistle valve: two modifications were fitted at the same time. The first was a more robust whistle valve for the chime whistle. The existing valve was a traction engine type which has not proved robust enough for the frequent usage that our whistle experiences and the valve has required frequent maintenance. As solution became apparent on one of the other locomotives based at Southall as 70000 *Britannia* has a chime whistle with a very robust whistle valve. Whilst at the

NRM extracting drawings for the P2, I took the opportunity to obtain a copy of the *Britannia* whistle valve. However this could not be used 'as is' due to the *Britannia* whistle being mounted on the side of the boiler sloping inwards in line with the circumference of the boiler. This meant that the mounting lug on the valve was at the wrong angle for our vertical installation behind the right-hand smoke deflector. To overcome this I redesigned the valve to keep the principal dimensions and means of operation but with mounting lugs horizontal to fit on the existing whistle bracket (see 3D drawing). A further departure from traditional practice was machining the valve body from a solid lump of large diameter bronze bar rather than producing a pattern and casting. As

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## RECYCLING FOR CHARITY

The Trust has registered to receive funds donated by recycle4charity from inkjet cartridges and mobile phones. An envelope to allow you to help in this way is included with this edition of *The Communication Cord*. If you require more envelopes you can either write to the Works at Darlington or you can go to [www.recycle4charity.co.uk](http://www.recycle4charity.co.uk) and register, selecting "The A1 Steam Locomotive Trust – C38037" (please note the "The" – it appears in the list of available charities under "T", not "A") as the beneficiary. At the same time you can select how many envelopes you would like to be sent to you.

it is unlikely that we will need another identical whistle valve, this process is slightly cheaper and much faster provided we have the talent of Tom Jones from M Machine available.

The new valve is now working but will benefit from a steam trap to ensure that steam is always available at the valve rather than water which until blown out stops the whistle sounding properly. It is hoped to fit this during the January/February maintenance period.

#### **Additional cylinder oil reservoir:**

the original class A1s were fitted with special large reservoir versions of the standard Wakefield 7Z mechanical lubricator. Apart from those on 60532 *Blue Peter*, we have not been able to find this version, so a standard 7Z lubricator was obtained (which had come off an MoD diesel shunter). It was considered that with the typical one-way trip for *Tornado* being 150 to 180 miles, the size of the oil reservoir would be sufficient - and for this kind of distance this has proved to be the case. However from time to time we do longer trips which have threatened to run us out of cylinder oil. Although it is normally possible to top up the lubricator at stops, if we are 'under the wires' or the locomotive stops with the driver's side adjacent to an open line, we are not able to top up.

To overcome this problem, an additional oil reservoir has been made. It has been designed to look like a second mechanical lubricator as carried by the non-roller bearing A1s and is located in the same place behind the existing lubricator. The oil in the new box flows into the existing

box through a balance pipe connected into the drain plug hole of the existing box. A sight glass of similar design to that on the existing lubricator has been fitted along with a filler cap.

Superheated steam oil is very thick at low temperatures and in order to keep it fluid, the existing lubricator has steam heating. This has been added to the new reservoir and the steam pipe between the new reservoir and the lubricator has been formed into an  $\Omega$  loop and silver soldered to the balance pipe.

**Air pumps:** during the preparation for the Fitness to Run (FTR) exam on Friday 30th November in anticipation of Steam Dreams' Ipswich-Bath 'Cathedrals Express' on 1st December, the rear air pump blew the lower steam cylinder gasket. With no time to change the gasket the FTR was completed on the front pump only.

During the run on 1st December trouble was experienced in maintaining air pressure with difficulty in releasing the brakes on two occasions. The automatic air brakes use the twin pipe system, one pipe is the brake pipe (with red couplings and isolating cocks on the hoses) which has to be raised to 72.5psi (5 bar) to release the brakes. The second pipe is the reservoir pipe with yellow connectors and cocks on the hoses and is used to keep the brake reservoirs on each vehicle charged up at 100psi (7 bar). The brakes will work satisfactorily using the brake (red) pipe only with the reservoirs being charged by the brake pipe when the brakes are fully released. The purpose of the reservoir pipe is to enable the brakes to be released quickly.



Minus her front buffer beam, A1 60163 *Tornado* undergoes winter maintenance at Southall, January 2013.

Ian McDonald





I'd like to start this column by wishing all of our covenantors, volunteers and other supporters a happy and prosperous 2013. Last year was yet another busy year for *Tornado* and therefore for the team of people needed to keep our locomotive on the rails. The highlights for me had to be our third - and this time overnight - Royal Train for

HRH The Prince of Wales, 'The Elizabethan' railtour from King's Cross to Edinburgh and return jointly with D9009 *Alycidon* and, as ever, our annual convention which was held for the first time in Peterborough and at the Nene Valley Railway.

It's hard to believe that by the time you receive this issue of *TCC* it will have been four years since that amazing day in York when *Tornado* was named by TRH The Prince of Wales and The Duchess of Cornwall. This followed hot on the heels of our first trains with our yet-to-be named locomotive - the two 'Peppercorn Pioneers' on 31st January and 1st February, the unforgettable 'Talisman' on 7th February when an A1 'came home' to London King's Cross for the first time in well over 40 years and our first commercial hire with Steam Dreams on 14th February.

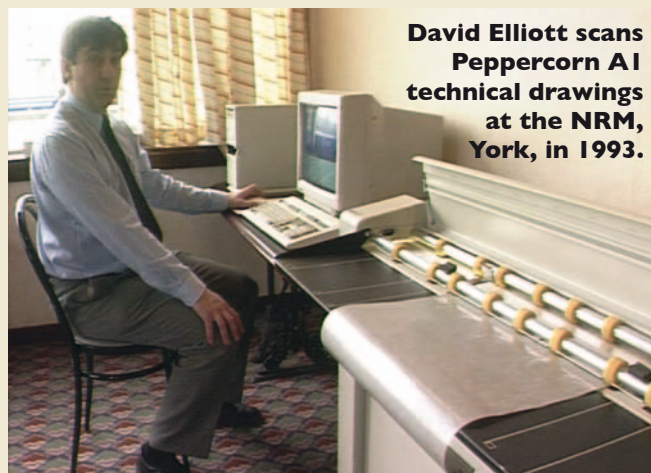
This thought made me take a look back to what was happening with our project 20 years ago...

On 13th April 1993 the painstaking job of cataloguing, scanning, cleaning up and re-drawing of the Peppercorn class A1 drawings began. The engineering team, led by David Elliott and including Gerard Hill, Bob Alderman and many others, spent several weeks at the National Railway Museum at York and in the end around 95% of the original drawings were discovered.

These drawings were mostly Indian ink tracings on linen and about 1,100 drawings were scanned in 1993 and a further 140 in 2001. These were then electronically de-skewed and cleaned with a few being completely redrawn due to poor quality originals. Many were subsequently modified or redrawn to add material specifications and tolerances. The Trust had also to make sense of such gems on the original drawings as "this bolt to be a good fit" and "this item to be made with special care" and ascertain exactly what "best Yorkshire iron" actually is. Well, we knew that Best Yorkshire Iron was described in London & North Eastern Railway Specification No. 41 of August 1939, but no copy of such a specification had been found at that time. It was a sure bet that such a material was no longer available, and the Trust would probably not want to use it if it was. It all seems a very long time ago for those of us who were around at the time!

Twenty years later we have already conducted a similar exercise for what could end up as the Trust's next project, the Gresley class P2 - more news of which will be communicated to covenantors once the conclusions of the feasibility study have been analysed and the business case thoroughly reviewed by the Trustees.

It is very heartening to know that even in these difficult economic times the Trust is still in good shape, putting away money to repay the bond and planning for the future. The secret sauce of the Trust remains the loyalty and support of our covenantors, and the professionalism and dedication of our volunteers - without whom none of this would be possible. This year I would like us to re-double our efforts to encourage more people to come on board as covenantors to support *Tornado's* future operations. It is vital for our continued success that we continue to grow our supporter base and I especially



David Elliott scans Peppercorn A1 technical drawings at the NRM, York, in 1993.

Ted Parker

urge you to encourage any children that you know who share our passion for our locomotive to join our *Tornado* Team.

Following the success of 'The Elizabethan' the Trust is planning to promote several of its own trains in 2013, with more information to follow in due course: Other tours are being developed.

London King's Cross to Edinburgh and return (*Tornado* outbound) - 'The Elizabethan' (6th June 2013). Date tbc due to operational issues

Sheffield - Settle & Carlisle Line - Carlisle and return (25th September 2013)

As you will already be aware, *Tornado's* normal winter maintenance period has been split into two and at the first of those in October/November 2012 our locomotive was repainted from Brunswick Green into Express Passenger received. We were delighted to be able to hold a special event on Sunday 25th November 2012 at the Didcot Railway Centre for covenantors, albeit with very short notice due to challenges in moving the locomotive. This change in livery has been almost universally very well received and has resulted in a big increase in photographs of *Tornado* in the railway press. Elsewhere in this issue you can read about the progress already made during the second period of January/February 2013.

Our support crew and merchandise team will be exceptionally busy in 2013, with packed forward diary of main line trains and heritage railway visits, delivering a well turned out locomotive for our passengers and some record breaking sales. As usual we are still looking for volunteers. It takes a lot of people to keep *Tornado* on the rails, not just those who travel with the locomotive as support crew or merchandise team but also those in the engineering team in Darlington, Southall and elsewhere. At the moment we are seeking people to help with on-train sales, finance, events, merchandise logistics, marketing & fundraising (including someone to help with *TCC*), giving presentations, archives, works guides, engine cleaning, engineering (especially on the support coach), support crew and works housekeep. There is always so much more that we could achieve with the right volunteer with the right skills and a can-do attitude. We are especially short of team coordinators who will take some form of managerial responsibility within their discipline. Please email [volunteer@alsteam.com](mailto:volunteer@alsteam.com) if you think you can help.

Thank you all for your support throughout last year. Your kind letters and emails always help to keep the team motivated. I hope to see as many of you as possible out on our trains in 2013. **TCC**



David Elliott

**Above: The new elements are almost completed at Southall, 25th October 2012. Technical 3d drawing of the chime whistle modifications. Right: Mick Robinson hammers out the last rivet from the bufferbeam.**



David Elliott



David Elliott

In order to prevent the train moving with insufficient air in the locomotive main reservoir, a protection valve is fitted to the locomotive which applies the brakes once the main reservoir drops below about 90psi and this was preventing brake release.

As an experiment the reservoir pipe was isolated between the locomotive and the train, after which the main reservoir pressure recovered enough to release the brakes.

During a subsequent investigation three small leaks were found by charging the air system from the Southall workshop air supply with the locomotive out of steam. When in steam the gurgling and hissing coming from the boiler makes it very difficult to hear leaks. All the leaks responded to spanners applied to pipe unions.

At the same time David Wright and team from Locomotive Maintenance Services (LMS) came to Southall to change the gasket on the rear pump. However on dismantling he found that the piston in the steam cylinder was loose on its piston rod. The piston is screwed onto the rod and the end of the thread on the rod is peened over to lock the thread. Part of the peened area had broken away allowing the piston to turn slightly on the rod. Repair of this was outside the capacity of the facilities at Southall so David took the pump back to Loughborough and made a new piston, locking it onto the rod by a better method than originally. The pump was returned to Southall, refitted and with the engine in steam for the next trip, set

up and tested satisfactorily. Unfortunately, just before coming off shed for the next train, the lower cylinder gasket blew out again. Fortunately the front pump was now performing well and the trip was uneventful.

In order to minimise the risk of further problems, two copper gaskets were made for the steam cylinder and fitted replacing the normal metal reinforced graphite gaskets. However, the lower gasket still leaked - not in the same place as before. Being a metal gasket, there was little risk of it being blown out, so the pump could be used in emergency.

The continuing problem with lower steam cylinder gaskets (four blown since the locomotive was new) suggests that there may be distortion of the cylinder block or cover which requires machining. As we had already planned to swap the rear pump out for overhaul in January 2013, the remaining tours of 2012 were operated on the front pump with the rear one in reserve.

## Annual Maintenance

As this piece is written we are in the middle of the Jan/Feb winter maintenance period which involves carrying out the annual 'C' exam. Other planned work includes re-lining the cylinders. In order to do this the buffer beam has been removed. Mick Robinson drilled and knocked out the 60 rivets holding it on (photo). Hawk Fasteners at Middlesbrough have been contracted to make fitted bolts to replace the rivets which will make future removals much easier. Bryn Engineering

has cut out the old liners and the front of the locomotive looks rather naked at the moment.

With the old liners out, some rust was found on the cylinders. To remove this and to add a shallow step half way along the cylinder to make fitting the new liners less risky, the cylinders are being lightly bored. The new liners have already been proof machined and the ports are being cut in them. Once the final cylinder dimensions are known the exterior surface of the liners will be machined to be an interference fit, then shrink fitted by cooling them in liquid nitrogen. The liners will then be bored back the nominal 19" diameter.

Meanwhile the pistons have been sent to MultiTech Engineering at Featherstone to machine turn them down to fit the 19" bores including making the ring grooves. The piston rods will be ground to return them to round and parallel.

The full set of coupling and connecting rods have been taken to the GCR at Loughborough to have the spare set of rod bushes fitted. The crossheads have also gone to Loughborough to have the white metal renewed.

With over 61,000 miles of operation, the slide bars have worn slightly hollow so the opportunity has been taken to have them ground back to flat by MultiTech.

Other work includes swapping the rear air pump, dismantling the front one to check on its condition, renewing the valve rings, swapping the turbo-generator for the freshly overhauled spare and several other minor repairs. **TCC**



# **TORNADO ON TOUR** *by John Wilkinson and Graham Nicholas*

## **'The Cathedrals Express', 24th November 2012** London (Paddington) to Shrewsbury IZ27 charter for Steam Dreams 479 miles run

With *Tornado* looking fabulous in her new blue livery we set off from Paddington for Shrewsbury. It was great to see so many people along the lineside for a first glimpse of the new livery. After Bristol the nature of this route changes with some serious climbing to be done. Weather conditions had deteriorated and we climbed Llanvihangel in the rain. Some great driving skills saw a good climb and arrival at Shrewsbury. Upon return to Southall the locomotive was prepared to be hauled to Didcot the day after for covenantors unveiling.



Ian McDonald

## **Unveiling of blue livery, 25th November 2012** Southall to Didcot for AISLT 96 miles run



Ian McDonald

In keeping with the traditions of the Trust we wanted to unveil *Tornado's* new livery to covenantors. At one point it didn't look like we could make it happen but with a lot of hard work at the last minute we succeeded. On Sunday 25th November 56312 from Devon & Cornwall Railways rolled onto Southall depot to couple up to *Tornado* and haul her with the support coach to Didcot Railway Centre. The run was uneventful until Reading where we were stopped with a suspected hot axle box - the hot parts were the cylinders so we carried on. The locomotive was very dirty from the previous day's run so on arrival the support crew led by Huw Parker encouraged as many people as possible to get involved in cleaning. After an hour she was transformed! The run back to Southall was straight forward and having left at 08:30 we were back at Southall before 17:00.

**'The Cathedrals Express', 29th November 2012**  
London (Victoria) to Bath & Bristol IZ96 charter for Steam Dreams 344 miles run  
From the title this run appears to be a walk in the park until one realises that it is a run round the Surry hills and then to Bristol. Running on the outward journey was pretty uneventful and following servicing at Bristol we proceeded back towards London. Excellent handling of the locomotive was required due to very difficult rail head conditions caused by leaf fall.



Peter Lovell



# TORNADO ON TOUR *(continued)*

Don Brundell



## **'The Cathedrals Express', 1st December 2012 Ipswich to Bath 1Z31 charter for Steam Dreams 410 miles run**

During this run *Tornado* reached 60163 miles during outbound run. Preparation had been a challenge with problems with the rear air pump. The journey to Bath ran to plan, however during the servicing at Bristol we encountered further issues with the air pump. With the problems overcome a good run back to London was had and the *Tornado* came at Wembley to return to Southall.

Don Brundell



## **'The Cathedrals Express', 8th December 2012 Southend to Oxford 1Z72 charter for Steam Dreams 252 miles run**

*Tornado* was called upon to deputise for 70000 *Britannia* because of its greater water capacity. A slow start meant the train was 19 minutes late leaving Upminster but the loco showed her usual strength in reserve and was only a minute late joining the North London line. Time was lost again out to Reading (15 minutes late) but an entertaining sprint thereafter to Didcot once again dismissed this handicap. After all this good work, it was a poor reward to be delayed on the outskirts of Oxford. A relatively uneventful run back saw the AI come off the train at Acton Yard on way back.

lan McDonald



## **'The Cathedrals Express', 10th December 2012**

**Peterborough to Winchester 1Z61 charter for Steam Dreams 499 miles run**

The longest run of the winter calendar resulted in a very early start as locomotive and train were hauled to Peterborough. A good run to Winchester ensued and locomotive and train carried on to Eastleigh for servicing. At Eastleigh the fire was found to consist almost entirely of dust and normal fire cleaning would not have been completed on time. A brief chat between John Wilkinson (RO) and Jon Pridmore (Duty Engineer) resulted in the fire being dropped out through the hopper ashpan. Support crew members were then seen breaking up wooden pallets so a new fire could be lit on clean grate. Servicing was completed on time and *Tornado* left Eastleigh under a healthy cloud of smoke for the return run to Peterborough.



**'The Cathedrals Express', 15th December 2012**  
**Ashford to Norwich 1Z86 charter for Steam Dreams 427 miles run**

Steve James



An early start from Ashford (07:45) meant a 'crack of sparrows' run down hauled by a diesel from Southall. *Tornado* did not enjoy a clear run on Southern metals and was over half an hour late on joining the lower reaches of the East Coast main line. But this is the locomotive's favourite territory and a magnificent performance thereafter via Hitchin (21 minutes late) saw the train back on time by Ely, going on to arrive at Norwich a mere four minutes late. The reward for a very early start was to be relieved at Battersea Loop on the return run.

Brian Stephenson



**'The Cathedrals Express', 23rd December 2012**  
**Kent circular via Rainham and Tonbridge 1Z88 charter for Steam Dreams 436 miles run**  
 This was another run standing in 70000 *Britannia* for gauging reasons. There was a little excitement on the outward hauled section when the feedpipe to the chime whistle sheared off. Once at Sittingbourne the pipe was isolated and a very pleasant day was spent travelling around Kent including climbing Sole Street bank twice in the day and visiting the coast at Dover. A successful run to bring a successful 2012 to a close.







Looking resplendent in blue in the December light, A1 60163 *Tornado* passes Santon Downham with the Ashford-Norwich 'Cathedrals Express,' 15th December 2012.

Don Brundell





# TOUR DIARY

Below are the future operations **Tornado** is confirmed to be involved in. More details will be published on [www.alsteam.com](http://www.alsteam.com) as trains are finalised. The contact details for tour promoters appear at the bottom of the page.

## 2013 Tour Dates

- **Saturday 9th March** – ‘The Cathedrals Express’ – London Paddington to Plymouth and return – promoted by Steam Dreams
- **Thursday 21st March** – ‘The Cathedrals Express’ – Peterborough to Bath & Bristol and return – promoted by Steam Dreams
- **Saturday 23rd March** – ‘The Cathedrals Express’ – London Paddington to Kingswear and return – promoted by Steam Dreams
- **Saturday 13th April** – ‘The Cathedrals Express’ – London King’s Cross to York & Durham and return – promoted by Steam Dreams
- **Thursday 18th April** – ‘The Cathedrals Express’ – London to Salisbury, Bath & Bristol and return – promoted by Steam Dreams
- **Saturday 20th April** – ‘The Cathedrals Express’ – London to Caernarfon-Holyhead and return – promoted by Steam Dreams
- **Tuesday 23rd April** – ‘The Cathedrals Express’ – Kensington Olympia to Carlisle (via the Settle & Carlisle Railway) and return – promoted by Steam Dreams
- **Thursday 25th April** – ‘The Cathedrals Express’ – Colchester to Carlisle (via the Settle & Carlisle Railway) and return – promoted by Steam Dreams
- **Thursday 6th June** (date tbc due to operational issues) – ‘The Elizabethan’ – London King’s Cross to Edinburgh and return (*Tornado* outbound and return locomotive to be advised) – promoted by The A1 Steam Locomotive Trust with booking through Pathfinder Tours
- **Saturday 15th June** – ‘The Cathedrals Express’ – Edinburgh Waverley to Inverness and return – promoted by Steam Dreams
- **Friday 21st June** – ‘The Cathedrals Express’ – Tunbridge Wells to Ely and return – promoted by Steam Dreams
- **Thursday 27th June** – ‘The Cathedrals Express’ – Norwich to Salisbury and return – promoted by Steam Dreams
- **Wednesday 3rd July** – ‘The Cathedrals Express’ – London King’s Cross to York and return – promoted by Steam Dreams
- **Friday 5th July** – ‘The Cathedrals Express’ – Lewes to Salisbury and return – promoted by Steam Dreams
- **Saturday 13th July** – ‘The Cathedrals Express’ – London to Beverley and return – promoted by Steam Dreams
- **Saturday 10th August** – ‘The Cathedrals Express’ – London King’s Cross to Newcastle and return – promoted by Steam Dreams
- **Friday 30th August to Thursday 5th September** – North Norfolk Railway, Sheringham.
- **Thursday 19th September** – ‘The Cathedrals Express’ – Canterbury to Salisbury and return – promoted by Steam Dreams

The Trust respectfully requests that anyone wanting to see *Tornado* follows the rules of the railway and only goes where permitted.

The following tour promoters and heritage railways are involved with the operations listed above:

### Steam Dreams

Web: [www.steamdreams.com](http://www.steamdreams.com) Tel: 01483 209888 Email: [info@steamdreams.co.uk](mailto:info@steamdreams.co.uk)

### Pathfinder Tours

Web: [www.pathfindertours.co.uk](http://www.pathfindertours.co.uk) Tel: 01453 835414/834477 Email: [office@pathfindertours.co.uk](mailto:office@pathfindertours.co.uk)

### North Norfolk Railway

Web: [www.nnrailway.co.uk](http://www.nnrailway.co.uk) Tel: 01263 820800 Email: [enquiries@nnrailway.co.uk](mailto:enquiries@nnrailway.co.uk)

The above tours are subject to operational change and [www.alsteam.com](http://www.alsteam.com) will be kept as up to date as possible.



## MERCHANDISE UPDATE *by Gill Lord*



**Hornby are releasing a BR Express Blue liveried model of *Tornado* in mid-2013.**

Here we are at the beginning of another year and looking back at 2012 which was once again a successful year with sales on the trains steady and when we did attend heritage railways we were extremely popular.

Our Christmas sales were similar to previous years and I am sure the new blue range contributed to some extent. Our Christmas cards always sell well; I am just hoping for a few snowy days this next month so I can get photographers out en masse to take pictures of *Tornado* in the snow ready for a new Xmas card later this year - one has to plan well ahead in this job! As I write we have a few 2013 calendars and diaries still in stock (see enclosed sales sheet) if you haven't yet purchased one.

You will be aware that we will be using our new support coach for our 2013 season. Our merchandise teams are getting very excited! We will have our own dedicated space where we can store our stock safely, make up all the orders in a less cluttered environment, an electrical socket for our till and card machines, etc... oh the joy! It does mean that we will have to review some of the ways we work at the moment but I am sure that after the first couple of runs we will be well on the way to a far slicker modus operandi!

Talking of our new support coach, now that all who purchased a 'slice' have had the opportunity to buy a Bachmann model of E21249 to enhance their Bachmann or Hornby *Tornado*, I can now offer for sale the remainder at a cost of £40. This price includes a £10 donation to the support coach fund. You can order one from the enclosed sales list.

This time of year is very slow, no trips and no events - or so you would think! For the merchandise team we have to be thinking ahead, what different items shall we add this year, which shall we discontinue, have we enough carrier bags, do we design a new tea towel, who is taking the photographs for the 2013

brochure we use on the trains, (actually it is Nigel Roake one of our team leaders and most dedicated volunteers) will we get it finished in time, we better had! Will we have enough volunteers for the trips, if we have a few trips within a few days we can sometimes be short of team leaders and stock or we have a team but not enough with the experience required for a successful trip, and this leads me nicely on to the next paragraph next point.

When you read this we will have had our second Merchandise Volunteers day, this year it is to be at Derby on 23rd February (postponed from 19th January due to the snow). I feel very honoured that 40 volunteers are attending. Some have not worked with *Tornado* before but

are happy to give up a day to see how we work. It will be a full day, starting at 10:30 and finishing round about 4:00pm. We will cover all aspects of selling but mainly how we work the trains, there will be a short playlet performed by Diana and Jan, a quiz, a logistics conundrum, John Wilkinson will be there to discuss support crew and merchandise team interaction, a hands on session with the tills and card machines, all in all a very good day will be had by all. I am hoping to make this an annual meeting to keep continuity within the sales teams.

If you would like to volunteer for the merchandise team, to work on trains, at heritage railways or movement of stock please contact me at [gill.lord@alsteam.com](mailto:gill.lord@alsteam.com). **TCC**

# 60163

## FOR SALE 10 TORNADO SMOKEBOX NUMBERPLATES

**All have been carried by *Tornado* and are available at £200 each – an ideal birthday present!**

- **21st - 22nd August 2010** - Mid Hants Railway
- **9th October 2010** - Annual Convention at Barrow Hill
- **3rd July 2011** - 'Torbay Express' – Bristol to Paignton & Kingswear and return
- **10th July 2011** - 'Torbay Express' – Bristol to Paignton & Kingswear and return
- **17th July 2011** - 'Torbay Express' – Bristol to Paignton & Kingswear and return
- **28th June 2012** - 'The Cathedrals Express' - Salisbury to Worcester and return
- **26th August 2012** - 'The Cathedrals Express' - London King's Cross to Norwich and return
- **30th September 2012** - 'The Cathedrals Express' - Maidenhead to Kingswear and return
- **24th November 2012** - 'The Cathedrals Express' – London Paddington to Shrewsbury and return
- **1st December 2012** - 'The Cathedrals Express' - Ipswich to Bath & Bristol and return

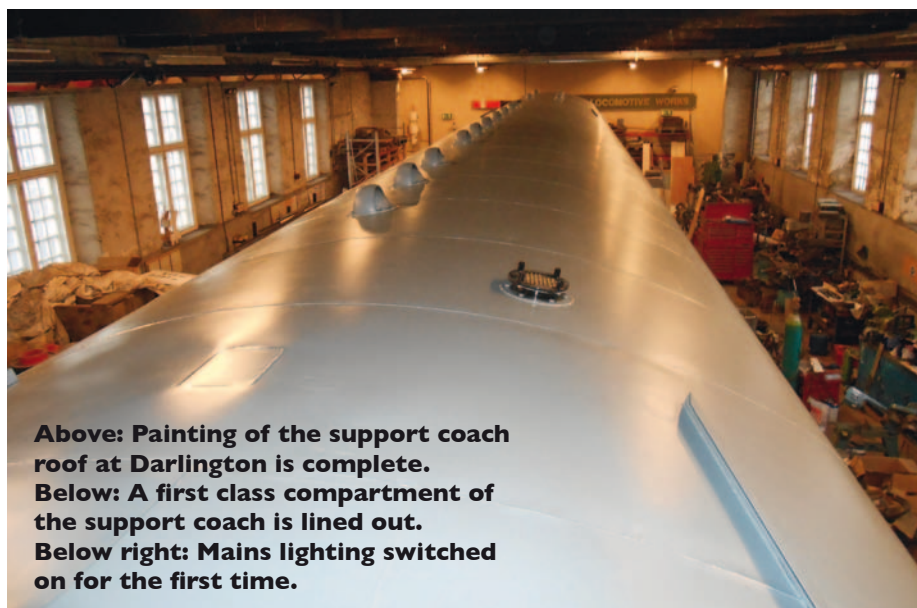
**To secure your number plate (all profits to *Tornado*) email [shop@alsteam.com](mailto:shop@alsteam.com). Please allow 28 days for delivery.**



# SUPPORT COACH PROGRESS *By David Elliott*

Substantial progress has been made with the coach including:

- Final fitting and plumbing the kitchen and toilet water tanks
- Manufacture and fitting four double boxes for propane gas cylinders
- Overhaul of our spare 200A 28V axle driven alternator to replace the 70A dynamo, including design and manufacture of a flat belt pulley to replace the alternator's original vee belt pulley. The alternator has been trial fitted to the coach.
- The interior is about 80% complete with the laminate surfaces looking very neat
- The gangways have been completed
- Doors have been stripped back to bare metal, filled primed and undercoated
- The roof has been rubbed down, sealant applied round rain strips and ventilator cowls primed and undercoated; the rest of the body has been rubbed down ready for gloss paint
- Thanks to a prolonged visit by Covenantor volunteers Robin Langstaff and Muriel Butterfield the underframe and equipment has received another much needed coat of chassis black paint
- The wiring has made good progress thanks to Paul Depledge; the emergency 24v lighting system has been partially tested using a battery
- The installation of the 4KVa diesel generator is almost complete and is awaiting the imminent fitting of the 230 litre diesel tank on the underframe
- Tom Snowball has completed installation of the propane gas central heating boiler,



**Above: Painting of the support coach roof at Darlington is complete.**  
**Below: A first class compartment of the support coach is lined out.**  
**Below right: Mains lighting switched on for the first time.**



steam/water heat exchanger, electric fresh water pump, steriliser and filter which will provide drinking water in the kitchen and toilet basin; the central heating system only requires the kick space fan assisted radiators in the kitchen

and guards compartment

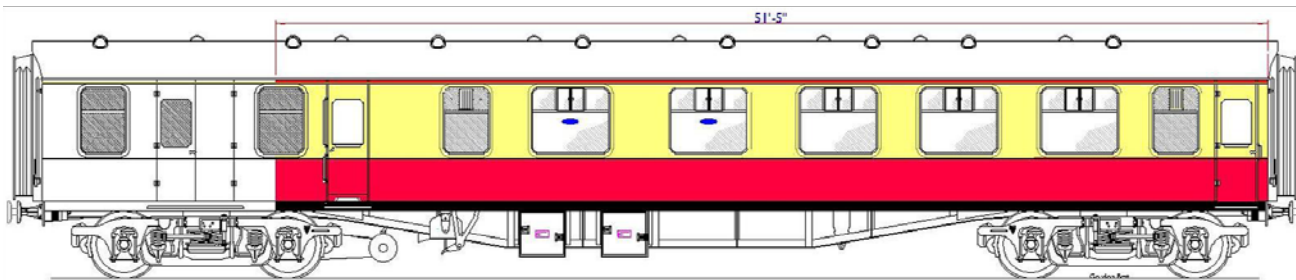
- Tom has also replaced the WC pedestal and basin in the toilet
- The brake pipework has been completed including fitting the gauges and emergency brake valves in the guard's compartment.
- A pressure switch has been fitted in the brake pipe to prevent the gas boiler from being used when the coach is moving as its balanced flue exhaust system would be difficult to certificate for 90MPH operation!
- The volunteers have continued with overhauling the ETH (Electric Train Heating) cables and connectors - there is now electric train heating on the coach - it is simply through wired for the infrequent occasions when the support coach is on the back of the train with a diesel locomotive behind it to heat the train.
- The battery boxes have been fully rebuilt to accept the higher capacity batteries which are due to be delivered at the end of January

The coach is on target for entry into service in the early spring - however we would appreciate more volunteers to help support the skilled contractors. Please [volunteer@alsteam.com](mailto:volunteer@alsteam.com) if you are able to help. **TCC**



**Custard paint applied to the support coach. 5 February 2013.**

## SUPPORT COACH FUNDRAISING



**Your support for 'Use Your Loaf' has now reached 51 feet 11½ inches or £62,300. Your help is urgently needed to help us to complete the job.**

**There is still an awful lot of work to be done to complete the coach this spring and there are a number of ways that you can help.**

- Volunteers to help with the work are always welcome, but you need to be available at the works during normal working hours. Please email [volunteer@a1steam.com](mailto:volunteer@a1steam.com) for more information

- Make a personal subscription to 'Use Your Loaf'

- Introduce Friends & Family to 'Use Your Loaf' and more people hooked on *Tornado*.

**Use Your Loaf:** Following the success of our dedicated donation scheme for the construction of *Tornado*, "an A1 for the price of a pint" we decided to raise the bread for the

support coach in a different way: 'Use Your Loaf':

- The coach is 63ft 6in in length – 762 inches – or 1524 'slices' at ½ inch each.

- Each 'slice' can be sponsored for £50; £100 for a 'doorstep'; £1,000 for 'half a loaf'; and £2,000 for a 'loaf';

- If all are sponsored, it would raise £76,200; if we assume 80% of the donations come with Gift Aid, this rises to over £93,000

And, as with the dedicated donation scheme, our 'Use Your Loaf' initiative comes with benefits for those generous enough to take part:

- A certificate recording the details of the sponsorship and a copy of a drawing of the coach noting which slice(s) have been sponsored

- Name inscribed on the official Role of Honour carried on the coach which will detail the slice(s) sponsored

- Entry into draw for main line footplate ride on *Tornado*

- Opportunity to purchase Bachmann model of E21249 (a perfect companion to the models of *Tornado*) with appropriate one of 1524 certificates produced for sponsors. The model costs £30.00 plus £3.00 postage & packing.

As of February 2013 the 'Use Your Loaf' campaign has raised £62,300 which translates to 51 feet 11½ inches of the coach's length, an increase of £2,150 since the last *TCC* was published, as illustrated on the diagram. Steady progress but we still have a very long way to go. We look forward to reporting progress in future Trust communications as coloured section grows to the full length of E21249.

## LOCOMOTIVE MANAGER'S REPORT *by John Wilkinson*

Since the last issue of *TCC*, *Tornado* has been through a period of maintenance during which the main achievements were a complete repaint in blue and replacement of the full set of superheater elements in the boiler. This was achieved in six weeks and then back to the planned runs up to Christmas plus, as you will see elsewhere in *TCC*, a couple of extra ones.

We ran into difficulties following the failure of the packing in a joint in the steam cylinder of the rear air pump. A plan was agreed to drop the pump down from its place on the frame in front of the firebox and the packing was replaced only to blow out again. Fortunately the front air pump

was proving reliable and we were able to continue running. At the next opportunity the pump was once again removed from the locomotive and a copper joint fitted. This repair was not entirely successful but enabled the winter programme to be completed.

At the same time as running the locomotive, dealing with the repairs that arise and being sufficiently flexible to accommodate the changes which emerged David Elliott and I were also pulling together the plan for the main part of the Winter Maintenance which commenced on 2nd January. This is more intense from an engineering perspective than the maintenance period before Christmas. To prepare

the locomotive for this attention it was necessary to clean out the firebox and wash out the boiler because as well as maintenance we are back into the season for inspections. This was all done around a pretty major dismantling of the front end of the locomotive. David Elliott will give more detail about the engineering work which is underway; as usual time is short with the first run already booked on 1st March.

Finally, a big thank you to all who contributed to running *Tornado* in 2012. That includes all the people who contribute behind the scenes as well as the merchandising team, chefs, support crew members and all the engineers.



# Covenantors' Diary by Alexa Stott

It's that time of year when, like a swan, we appear to be gliding along without much effort but the actuality is that we are paddling frantically beneath the surface. With *Tornado* tucked away, out of the public eye, in her Southall operational base, you could be forgiven for thinking that the Trust team is sitting back enjoying a well-earned rest. If only! As you will read elsewhere in this issue of *TCC*, *Tornado* is currently undergoing

the second half of her annual winter maintenance and the support coach overhaul continues apace with the intention of having it ready for the start of the 2013 operating season in March. Still in Darlington, we have been reviewing the scale of repairs required to the Works and we are hopeful that we will offer some financial help as we start to prepare the building for our next project, whatever that might be! And the merchandising team, led by Gill Lord, hasn't been resting on its laurels either, with a weekend of intensive training in Derby in preparation for another busy season.

All this activity requires – and will continue to require – a large amount of volunteer input and our thanks go to those covenantors who have already put their hand up. But we still need more help. If you feel you could contribute in any way with a few hours of your time, please email [volunteer@alsteam.com](mailto:volunteer@alsteam.com).

Rewinding back to November now, it was wonderful to see so many covenantors and their families, and members of the *Tornado* Team, at Didcot for the unveiling of *Tornado* in her new

livery – especially as the event had out of necessity to be arranged at such short notice! Although rain threatened at times, the overcast conditions could not diminish the beauty of the new livery; indeed it even served to emphasise it. And when the sun finally did make an appearance, there were audible oohs and aahs of appreciation.

So what is in store for Covenantors in 2013? *Tornado's* schedule is always a 'work in progress'; however, we hope to have confirmation of some preserved railway visits soon and, if possible, we will arrange a covenantors' 'day out' at one of them early in the year. A number of Trust tours have also been proposed, including a repeat (in reverse) of 'The Elizabethan', and of course we will have our Annual Convention to look forward to in the second half of the year. Further information on all these activities will be sent to covenantors when the details are confirmed.

Finally, as always, may I thank those covenantors old and new for their commitment to, and support of, the work of the Trust; and I and the other Trustees look forward to seeing you in the course of 2013. **TCC**



**Above: Four enthusiastic members of the Tornado Team at Didcot.**

**Below: Covenantors admire Tornado's BR Express Blue livery after her roll-out at Didcot.**



# NEW GSM-R RADIO FITTED TO *TORNADO*

by Rob Morland

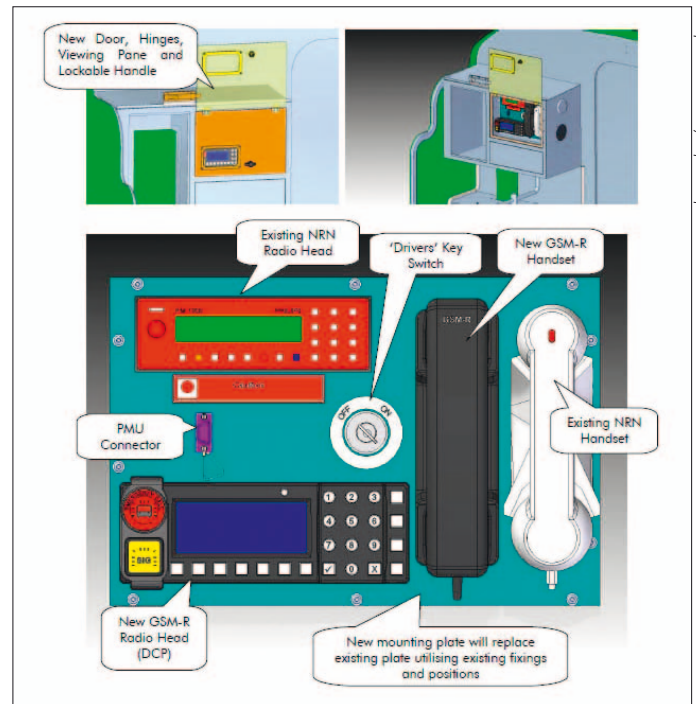
Like most locomotives on the national rail network, *Tornado* has until now operated with an analogue NRN (National Radio Network) radio, which is used by drivers to communicate with controllers and signallers. Our NRN radio is installed in a purpose-built radio box on the tender.

The whole of Europe is now in the process of converting its railway communications to a new digital system called GSM-R. This uses similar technology to your GSM mobile handsets, with some special features to make it suitable for safety-critical railway use. As well as providing voice radio communications between drivers and signallers, GSM-R also supports data communications, text messaging and is the communications bearer for the new European Rail Traffic Management System (ERTMS), which is currently being operated on the Cambrian Coast line in Wales.

The UK's GSM-R system was authorised in May 2002 and Network Rail's GSM-R programme represents an investment of around £1.9 billion in new radio infrastructure and radios. The project operates under a Network Change Notice, in this case NCN5, which obliges Network Rail to fit the new equipment to operating locomotives on an approved list free of charge.

The AI Trust has been working with Network Rail since 2011 to help them plan and manage the fitment of GSM-R to the fleet of around 30 steam locomotives that operate regularly on the main line. Early in 2012 Interfleet was contracted to fit the heritage steam and diesel locomotives and our radio was fitted whilst the engine was at Southall during our first winter maintenance period in November 2012.

**Right: A key to the GSM-R digital communications hardware that was installed in *Tornado's* cab during November 2012.**



Graphic courtesy of Interfleet.

We had designed our radio box with GSM-R in mind, which has resulted in a neat installation with the GSM-R Driver's Control Panel sited next to the NRN radio and the speaker fitted to the side of the box. The Radio Unit (containing the radio transceiver and digital electronics) is mounted in the left side lower locker and the antenna is located on a bracket above the door in the tender coal space.

Other steam locomotives without on-board electricity generation required additional batteries for their GSM-R radios, but as *Tornado* has a fully redundant dual power supply, including two generators on board, the radio has simply been connected to the miniature circuit breaker in the Essential Services Power Supply that

we provided for it during the build.

Operating the radio on steam locomotives is going to be different from modern traction as there is insufficient space within reach of the driving position to fit the radio unit and handset. This means that the radio will usually be used by the traction inspector or fireman if the engine is on the move. In rare cases where the driver needs personally to use the radio then he will stop the train in order to do this. A special arrangement called a 'derogation' is written to cover this and a small number of other differences between the steam locomotive installations and those on modern traction.

The old NRN radio system was turned off south of a line joining the Wash and the River Severn at the end of 2012, so we shall be using our GSM-R radio on this part of the network as soon as *Tornado* gets back on the main line at the end of February 2013. North of the Wash, both NRN and GSM-R radios will be used for a further period until the whole network is completed and commissioned.

The next innovation for us will be ERTMS. We are unlikely to be making use of the system on the Cambrian Coast, but Network Rail plans to install ERTMS on the Great Western main line as part of its electrification and signalling upgrade. Fortunately we knew enough about the requirements of ERTMS when we were designing the AI electrical system and we have already provided sufficient power for the system to be installed when required. **TCC**





The A1 Steam Locomotive Trust is pleased to display the logos of organisations giving us their ongoing support. Their contribution is gratefully acknowledged.



**PRINCIPAL SPONSOR**



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Designed by Debbie Nolan

\* All information correct at the time of going to press on 10th February 2013. For up-to-date information and dates please check the website [www.a1steam.com](http://www.a1steam.com).

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Darlington Locomotive Works is normally open to the public on the third Saturday each month (11am – 4pm).

Access to the works is via Head of Steam: Darlington Railway Museum where covenants are entitled to free entry. Charity registration No. 1022834. The Trust respectfully requests that anyone wanting to see *Tornado's* main line passenger trains follows the rules of the railway and only goes where permitted.

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