

Reading Society of Model
Engineers
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The Prospectus

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Free to members



Watched by his mum, Jackie, Quinn takes the new club Polly on its day's first outing. Photo Peter Harrison

HST FAREWELL ISSUE

**Our Prospectus Correspondent is
aboard the last express GWR HST**

DAWSON'S DIARY kept by the President

I am pleased to report that the club's Polly loco has been successfully steamed and was given its first run on the track on Saturday 11 May 2019, with minor snags which is normal. We must thank Peter Harrison also Stuart Higgins for all the effort put in by these two members over the last few months. Our young member Quinn looked so happy taking over the driving with Pete on board. A big grin said it all a very happy young lad! We have a name for the new engine – all will be revealed.

On the same day our two recent new members Mark Kirton and Ray Clark brought along Mark's very nice 5" gauge German 0-8-0 narrow gauge with a jackshaft drive. This loco also had its first run on the track. It ran very well and Mark was pleased with the smooth running on the tracks. It was soon loaded up with passengers. The 0-8-0 was very sure footed, our Quinn once again had a big smile on his face!

Nigel Penford and Mike Manners are progressing well with the brick storage cupboard. The roof is now in place. It needed a good few strong members to lift the large paving slabs in place. The roof has been sealed and finished with roofing felt. The doors are the next items to make fit, there is much more work left to do. In the end it will improve the 7 ¼" steaming bay operations.

We had a good turn out of locos this time just to name a few; two Maids of Kent, three Sweet Peas, a K3 2-6-0 and of course some Simplexes also many electric engines and not forgetting the many Pollys we have in our club. I have been thinking – we will have to have a cage to put them in at night! We cannot have all these Pollys dropping their ash pans all over the place can we?

PONDERINGS by 61249

These articles are taking on a life of their own. Barely had I sharpened my pencil to carry on talking about engineering virility symbols, when the editor rang me to ask if I could do a valedictory piece on HSTs, owing to the fact that the last regular scheduled run on the Great Western Main Line of a full HST was planned for Saturday 18th May, at 18.30.

I leapt at the chance because I had just been invited to travel on this very train, by GWR, and am starting this article flying towards Paddington to pick it up. I am in what feels and looks like a vibrating MRI scanner. No, this is not the NHS providing services on the move, but the soulless spartan grey and unrelieved plastic of an IEP interior at 200kph. Windows not clean, ride not great, but performance on electric is sparkling – 11 mins on my watch start to stop Reading -Slough (18 miles), or 98mph average. However, everyone with a stopwatch



Andy Skinner (chief engineer GWR) and Sir Kenneth Grange (who designed the iconic shape) by 43002, one of the original Bristol allocation..

Photo 61249

knows that they have a job matching HSTs on diesel.

Enough about IEPs, this is a valedictory article about HSTs. There is a very strong case to conclude that the HST is one of, if not the, most successful train ever built. A phenomenal train, in terms of its engineering, its operations, its business and economic impact. The fact that it became a style icon for modern InterCity travel and inspired more than one generation towards rail are just significant add-ons.

So let's start with the **engineering** – which was in many ways the most important part of the achievement. The engineering concepts of the train are brilliant. To run at 200kph as opposed to 160kph on the same track and between the same signals placed a serious task in front of the designers, bearing in mind that track damage was to be no worse than a Deltic. The level of facilities to be offered to passengers in terms of air conditioning, catering, etc. was another leap forward, and all of this with a step change in availability and utilisation. If it was a challenge, then the engineering response was “let's show what we can do”.

In the entrails of the APT debacle it is possible that the engineering came first and the business demands were defined afterwards. You need a better historian than me to know this. These demands taken together drove some important principles – high speed diesels for power to weight ratio, flexible motor drives to reduce unsprung weight on the axle, modularisation of the hotel services on the trailer cars, wheel mounted disc brakes etc. etc.

Two points are worth a special mention. One supremely technical issue was the design of the bogies. The trend at the time (early 70s) was to add dampers and links to compensate for known bogie and wheelset behaviour. BR Research

had investigated the first principles of wheel on rail dynamics and was modelling them through the early use of mainframe computers. The programme to do this occupied the Derby Research centre computer all night, which led to its name of “Vampire”. Its principles and applied knowledge delivered a suspension of elegant simplicity and a ride which is often quoted as the standard to beat on new trains, and rarely is.

Secondly, the catering vehicles were of unparalleled complexity. Boilers, warming cabinets, “Bain Marie”, hot plates, ovens, microwaves, fridges, freezers, chilled storage and even, at the outset, beer on tap at a slightly warmer temperature than the lager. Much of this kit had never been on a train before and some of it worked. The abandonment of tap beer was not a temperature issue, but more to do with the least reliable piece of kit ever installed on a train – the little counter that told management how much beer had been sold. A small innocuous little counter dial, it was clearly put in the wrong place as all sorts of damage was inflicted on it very quickly. Management soon gave up, but everything else was kept and made to work.

The biggest impact of modularisation was on the air conditioning where the changing of units without delay to the train’s operation became a routine feature of depot life. The brake equipment was similarly organised, but rarely needed the module changed. Nevertheless, having all of the working parts under the vehicle and readily available to work on easily was a great move, and much better than being hidden away on the roof where the waves at Dawlish roll over it, or where it can leak on the customers. Avoiding the need for underfloor engines through power cars gave the space for this concept which has proved its worth, but has largely been lost in modern replacements – for what? In lavishing all this praise, I cannot miss the one mistake – slam doors, subsequently given secondary locking. Power doors were possible, and should have been the selection, giving a much better in coach environment, and greater passenger safety. An opportunity missed.

The longevity of these design concepts brought to real life on the production train have been the cornerstone of the train’s operation.

Operationally, the step change was also awesome. It was the first time that the concept of a “whole service” had been used in the UK. We were used to special trains, named expresses etc and of course Pullman services. Arriving at Bristol for London, you might get a Blue Pullman, you might get air conditioning, or you might get steam heat. From the introduction of HST, HST was what you expected, and HST was what you got. A great concept and I must say that we adhered to it very successfully. There may have been a few loco and coach substitutions in moments of crisis, but very few. They could not meet the timings and everyone knew how unacceptable they were. Things can go wrong during the day, but every morning at Bristol we turned out the whole service to meet those passenger expectations for every day of at least the first year of 125 operation.

We had thirteen of the first 27 sets allocated to St Phillips Marsh, and as I



The penultimate HST service passes through Twyford on time on 18 May consisting of 43185/43009 on the 18 22 to Hereford.

There was great public interest and the station staff kindly opened platforms 1 and 2 for a good view.

Photo
John Billard

remember it, eight trains off shed every morning. With two from the shed and 6 from the sidings. (Mathematicians among you will realise that this left three trains to be starting from somewhere other than Bristol). That left us just one road for the “stopped” unit, on exam or repair, and we were full. What this meant, and this was a feature of the change for the whole service, was that there was only one way it worked, and that was the plan. With 85% planned availability (2 sets, one on exam and one spare) the lift from the 65% that we were achieving with locos was a step change.

The utilisation was even more remarkable, as every day, each set would turn around a thousand miles, and would be in traffic all day – for between 14 and 20 hours. Apart from turn round in termini, they would be on the move. Our class 47s and 50s from Bath Road might do half this. Some did two London return trips in a day, but interruptions were legion, Ranelagh Bridge for refuelling, or Empty Carriage moves, plus of course the tendency to be left on the buffer stops by the departing train, then wait an hour or two for their next turn. The plan for locos was that they stood still for most of the time. The multiple unit working of HSTs turned this on its head and means that with each set doing over 250,000 miles per year, each has amassed over 10 million miles in its working life. The WCML electrics, at the time HSTs were introduced, were looking at around a million miles in their lifetime. What a change!

What was also clear from day 1 was that these were not just High SPEED trains. The timings relied on them being High PERFORMANCE Trains. With stops every 20 – 30 miles and very few real expresses in the timetable the working cycle for the engines was brutal with extreme thermal cycling and very little cruising. Keeping time demanded the acceleration more than the high speed.

One more word about Operations, which was the dramatic impact these trains had on the staff who maintained and operated them. They were so obviously much better than what we had, that HST became magic words and folk would volunteer to do something for an HST which they would complain to their Trade Union about on a loco. St Phillips Marsh was staffed with volunteers chosen from a pool at Bath Road, and no-one had to be coerced into working there. Why? The train was iconic, clearly a great piece of kit and everyone wanted a slice of the action. No wonder we had to have two drivers! A trial run on a summer Saturday? No problem. A special run to break a world speed record? When would you like it? Heady and exciting days, that turned into one of, if not the, most successful trains in operation, all-time, worldwide.

The **Business and Economic** impact of these trains has also been quite remarkable. For BR, it saved Inter-City in competition with a fast-moving car industry, and motorway expansion/consolidation. Peter Parker, that great communicator and Chairman of the British Railway Board came to Bristol and stood at the end of the new shed. “Cliff” he said, (he really meant 61249) “this shed is long and thin, just like the tightrope we are on, if this train works, we have an Inter-City product and a business, if it doesn’t, we don’t”. So that’s what the Chairman thought at the time, no pressure then! The train opened up new possibilities for business connections, it suddenly became possible to make London for the day from the West Country, do your thing, meeting or event, and get home before bedtime. Even more profound was the possibility of long-distance commuting, with a house by the sea or in the country costing a fraction of that one 60 miles or just 35 minutes nearer London. Great Britain suddenly got smaller. I remember telling some Scottish journalists visiting before the Eastern started their service that they could forget Independence since Edinburgh would feel like little more than a London suburb! They loved it, as you can imagine.

Economically, land values round stations on the route went up dramatically, while companies saw the opportunity of moving their operations outside London. Reading became a place that people commuted into, rather than out of, Bristol became the centre of the banking/Insurance operations etc. etc. As railways shaped the country in the 19th century, so HST shaped it in the latter part of the 20th.

As we sped through Twyford on the last service HST from Paddington, I believe the Editor was waving from the platform! There were tears in lots of eyes, the world’s fastest diesel for 40 years was moving to a new phase. **A phenomenal train, phenomenal engineering, phenomenal operations, phenomenal impact!**

(and made in Britain... Ed)

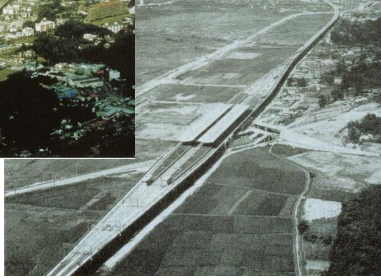
(HS) Rail good at Economic Growth



2004

Shin Yokohama station

1964



The economic impact of High Speed Rail - noting how the high land values close to the station makes the buildings taller, as well as the way the town has moved!

Courtesy
61249



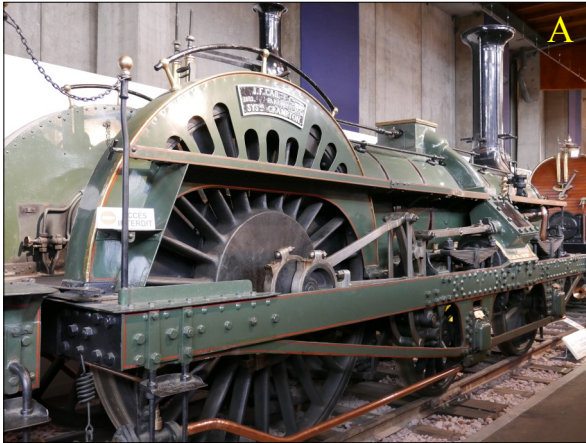
Above The 1303 HST Plymouth waits at Paddington on 15 May.
Right Slam doors and droplights ending their time at Padd since railways were invented. That day the editor was heading for the 1258 to Twyford when he saw the 1303 on Platform 1 and couldn't resist a last run to Reading. Well worth the four pounds excess fare! Photos John



KISS by John Spokes

KISS - Keep It Simple, Stupid was a maxim I often used as Engineering Manager on oil and gas projects; a philosophy anathema to the chemical engineers I managed and, it would appear, to the designers of French steam locomotives. I probably already knew this from various books on French Railways, in particular that tome, *La Locomotive a Vapeur*, written by Andre Chapelon or Edouard Sauvage's various updates of his book 'La Machine Locomotive'. The idea was recently reinforced by a visit I made to the French Rail Museum, Cité du Train, in Mulhouse, a short hop north of Basle.

My plan was to visit this and then move on to the nearby Automobile Museum, where allegedly there are 123 Bugattis. (Other makes are available.) However, you can spend, and I did, a whole day looking at 'trains'. So much to see, from the earliest days of the 1830s to the record-breaking electrics of the mid-fifties and more recently the TGV. There is a Nord Baltic, sectioned in the way of Ellerman Lines at York, but using 'moving LEDs' to show the processes involved. An SNCF 2-8-0, supposedly derailed by the French Resistance, lies on its side and permits one to see the 'under-carriage', so to speak. A more detailed view of the workings of a Nord Pacific can be got by a walk-through pit underneath.



The zenith of French steam is the large compounds, some home-grown and others supplied after WWII by US manufacturers. Of note is Marc de Caso's Hudson (**Photo J**), which every half hour is run-up on a rolling road to the background of an accelerating steam engine. This prototype would make a beautiful model in 5' or 7 1/4', but something of a challenge as there is hardly a straight line and the stream-

line casing is a myriad of compound curves.

French locomotives and rolling stock are generally elaborately detailed and it is on these I concentrate rather than the typical three-quarter views. So, what were the highlights (for me):

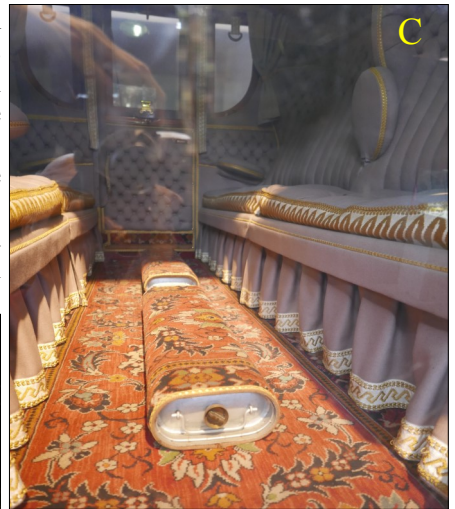
Photo A A Crampton loco, No 80 *Le Continent*, built for L'Est by Cail & Cie. in 1852. Not a popular configuration outside of France, but an epitome of early Victorian elegance. My photo shows one of its 2.3m dia drivers. Like many



French locomotives of this period it was equipped with outside Stephenson's valve-gear.

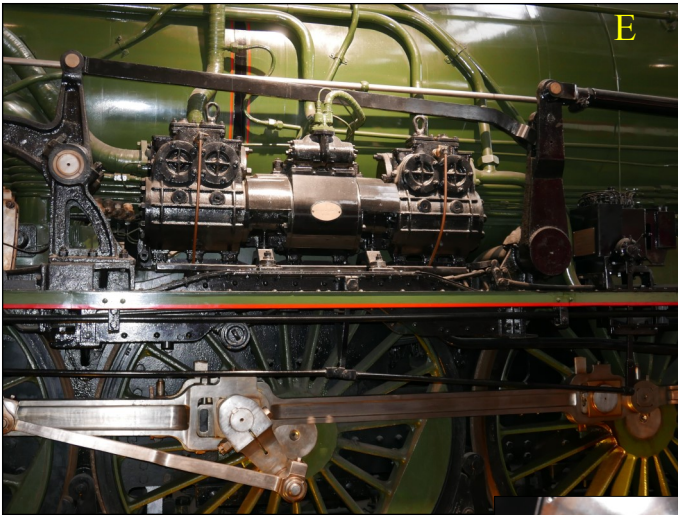
Photo B, of a slightly earlier date is a NORD Railway First Class 4-wheeler, which is reminiscent of the Liverpool and Manchester carriage which most of us will know. This vehicle has been beautifully restored, and **Photo C** shows the ornate carpet

and matching footwarmer. The museum has a large collection of other carriages from magnificently turned-out Presidential saloons, opulent Wagons-Lits and some very basic stuff for the proletariat. One carriage has the words 'Defense de Cracher sur Le Parquet des Voitures' painted in large letters on the end bulkhead. This translates as Do not spit on



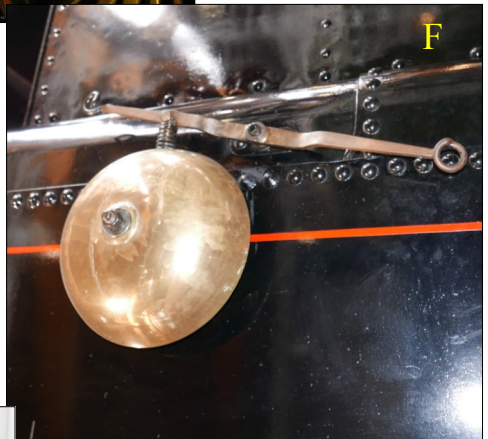
the carriage floor! **Photo D** illustrates an early 20th century attempt at double-decking. **Photo E** is the duplex feed-water pump on the 1952-built 241 P 16, a 4-cylinder 'Mountain-type' compound capable

of producing 4000 hp. This pump is a possible modelling solution for members of RSME who are experiencing injector problems. It would seem that the overriding principle of French loco design was: if there is any available space on a running-board or between the frames then fill it with something (complicated).



Another interesting detail is the tender-mounted alarm bell (**Photo F**). The hook where the ‘communication cable’ is attached can be seen, but whether the bell could be heard by the crew above the roar of the journey is a questionable matter. From what I have read, I believe that French loco crews

were trained to a much greater extent than their British counterparts. Probably justifiable with the additional mechanical complications and more so the extensive use of compounding with variable cut-offs and separate regulators for both HP and LP steam circuits. *Le Mécanicien’s* determination of speed did not rely solely on experience and the sound from rail joints. Many locomotives of the steam era were fitted



with a Flaman-type speed indicator or Tachymetre. **Photo G** is of a typical device. This not only permits speed indication, but there is also a re-settable clock for recording point-to-point time and the roll-chart recorder. In addition, the driver had to operate a mechanism at certain points and by this means make a mark on the moving chart. This was to prove he was appropriately monitoring the progress of the train. (Apparently, some A4s were fitted with Flaman



H recorders, but probably not that effective for ‘online’ monitoring: they were fitted under the fireman’s seat.)

Not all early French locomotives were constructed with lines as elegant lines as Marc de Caso’s Hudson. **Photo H** shows a 1900 PLM 4-cylinder 4-4-0 known as a Coupe-Vent (literally Wind Cutter). This feature was popular with the PLM

in the early part of the 20th century and allegedly beneficial when battling against Le Mistral, an infamous wind that blew up the Rhone Valley.

So much for steam; next month I’ll talk about some of the electric exhibits.



Photo J

SNCF four cylinder compound of 1940. one of only four built before the second war and then overtaken by electrification.

All photos
John Spokes

DIARY

JUNE 2019

Saturday	1st	Birthday Party	11am to 13:30
		Birthday Party	14:30 to 17:00
Sunday	2nd	Public Running	13:00
Saturday	8th	Club Running	11am
Sunday	9th	Birthday Party	11am to 13:30
		Birthday Party	14:30 to 17:00
Monday	10th	Trustees meeting	19:30
Wednesday	12th	Beaver Group	17:30
Friday	14th	Beaver Group	17:30
		Tank Club bbq	
Saturday	15th	Tank Club w'end	All day
Sunday	16th	Tank Club w'end	All day
Saturday	22nd	Young Engineers and Club Running	11am
Saturday	29th	Birthday Party	11am to 13:30
		Birthday Party	14:30 to 17:00
Sunday	30th	Autistic Pride event	11am

JULY 2019

Saturday	6th	Birthday Party	14:30 to 17:00
Sunday	7th	Public Running	11am **

** Berkshire Motor Show in the park

*** All times subject to alteration

Comments by RSME members on any subject appearing in Prospectus are welcomed by the editor.

Opinions expressed in PROSPECTUS are the personal views of the contributor and cannot be taken as reflecting the views of the club committee or editor.

The deadline for the July issue is 18 June This is the final date.

Contributions may be submitted in hard or soft copy to the editor.

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