



# Trainsimming Modern French Railways

Part One March 2003

V1.1



*TGV Duplex at Valence  
TGV station. Model By  
Pierre Meut,  
Belphegor, NewAlex,  
Clem Tillier,  
Edouard Staniczek*

## ***In Part One:***

- **Background to French railways**
- **Signaling**
- **Classic routes**
- **High Speed Routes**
- **TurboTrains**
- **TGV's**
- **Resources**

Following the previous series on German railways, we cross the Rhine to look at Modern French Railways.

As before, this is an introduction to the what, when and how - what locomotives or other stock is in use, when was it used, how was it used and what color schemes are used.

In Part One we look at background to French railways today, signaling, then at two classic lines the **Etoile de Savoie** route, a route set in the mountains of Haut Savoie, and **PACA** part of the **Marseille – Vintimille** railway along the Mediterranean coast, and two High speed Lines the **LGV Nord Europe** from Lille and the **LGV Méditerranée**.

In addition we look at the Turbotrains and TGV trains.

In Part Two we will look at locomotives and color schemes, and Part Three passenger stock and color schemes, and EMU's and DMU's.

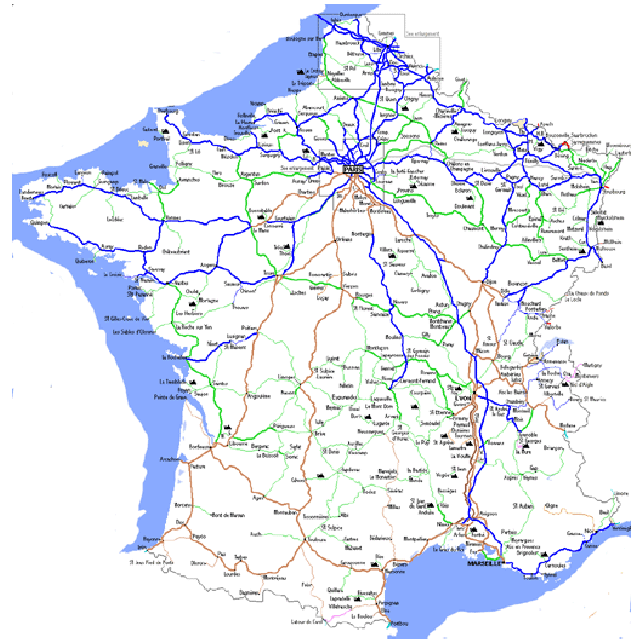
Because French freight stock uses the same classification system as German stock, and there is little specific French only MSTs freight stock, there will be no detailed section on French freight.

As before there will be a resources section.

With many high quality models available of French stock and two world class freeware routes, the classic Etoile de Savoie and the High Speed LGV Med now is an excellent time to trainsim Modern French Railways

*The Network of French railways  
converging on Paris. 25 kV AC  
Electrified lines on in blue, 1500 V  
DC is brown and Green is non  
electrified.*

*Full size map from  
<http://www.bueker.net/trainspotting>*



## Background to French Railways

Today the SNCF (French Railways) exploits 31,385 km of lines, of which 14,464 km are electrified, within this 1,540 km are high speed lines.

While it may not be true that all roads lead to Rome, it is almost true in France that all Railways lead to Paris. In marked contrast to say Germany, where there are a number of cities of almost equal size, in France out of a population of 61 million, 10 million live in Paris and the surrounding region (the Ile de France). The next largest cities with 1.4 million are Lyon the original capital of Gaul, on the confluence of the Rhône and Saône rivers, and Marseille at the mouth of the Rhône on the Mediterranean Sea.

**French trains run on the left**, except in Alsace and Moselle which were part of Germany between 1870 and 1919, where right hand running is the rule and German-style signalling can still be found. The change from left to right hand running is made on the flat at Mulhouse, but at all other locations there are flyovers.

The next two are Lille in the north in Flanders (1.1m) and Toulouse in the southwest with 0.9m. Three sides of the

Hexagon (as France is called) are mountainous (the Vosges, Alps and Pyrénées), and three are sea – the Mediterranean, the Atlantic and Channel. Only in the North where the plains of Flanders merge into the Low Countries is there easy access. In the lower center of France the Massif Central prevents easy access from Lyon to Bordeaux.

The network of French railways clearly shows this topography, with the lines spreading out from Paris, roughly following Route Nationale system.

Issuing concessions to private companies, together with state aid, controlled the building of French railways. By 1860 they had coalesced into six:

**Chemin de Fer du Nord** (Northern Railway) – serving Flanders and the North of France with its terminus in Paris at the Gare du Nord.

**Chemins de Fer de l'Est** - (Eastern railways) servicing the East of France, and after 1918 the recovered provinces of Alsace and Lorraine, although the lines in Alsace and Lorraine belonged to the state.

**Chemins de Fer de l'Ouest** (Western railways) serving Brittany and the West of France from the Gare Montparnesse, and also Normandy and the western Paris suburbs from the Gare St Lazare. The Ouest was always

in major financial difficulties and in 1908 was taken over by the state and known as the **Chemins de Fer de l'Etat** (State Railways)

**Chemins de Fer Paris –Orléans** Paris Orléans Railway PO – serving the area South of Paris roughly to a line level with Bordeaux from the Gare d'Austerlitz, and later with the electrified extension to the Quai d'Orsay

**Chemins de Fer Paris-Lyon-Méditerranée** Paris, Lyon and Mediterranean Railway PLM – known as the La ligne Impériale serving the area roughly East of Paris Lyon Marseille from the Gare de Lyon rebuilt in 1901 with its magnificent clock tower

**Chemins de Fer du Midi** – South West France – the only one of the six companies with no terminus in Paris.

Napoleon III ordered the Railway companies in Paris to construct a ring linking them, within the city walls – **The Petite Ceinture** (Little beltway)– which carried extensive passenger traffic (until the Metro arrived) and freight. Part of it is still used as part of the RER (see below), and part disused.

Further out, at a level with Versailles, a second ring was constructed between 1877 and 1882, the **Grande Ceinture** (large beltway), with marshalling yard where it met the lines coming into Paris. Further links between the lines out of Paris were built further out than this.

In addition the State voted the **Plan Freycinet** in 1879 to finance railway lines to each town with a Prefecture or sub Prefecture in France, creating departmental railways, but many of these lines were uneconomic and have been closed or used only for freight since 1939.

The railways were partly nationalised in 1938 to form the **SNCF the Société Nationale des Chemins de fer Français** (French National Railways), of which the State has 51% and the predecessor companies the remainder.

## Electrification of French railways

Whole books have been written of the electrification of French railways, particular because it uses both 1500V DC and 25 kV AC lines, and so has electric locomotive for each, or Bi-current locomotives.

Following the First World War, and following the experience of the lack of coal the Government wanted to electrify the South of France using Hydroelectric plants, and having sent engineers to the US decided on 1500V DC using General Electric technology. This technology is in fact very suited to running heavy slow trains, which was the French practice. By WWII France had 3300 Km of electrified line, of which 3000 was in the Midi, which had merged with the PO. The only other line major line

was Paris-Le Mans electrified just before the war as a Depression project. The PLM, however, refused to electrify the Paris Lyon line as it felt it could not justify the cost, and the lines in the North and East were not electrified because of fear of possible war damage.

Following WWII, when 40% of the stock was destroyed the priority was buying US Engines to restore the stock, as a result of which France never has a policy towards diesel in the same way as the US or the UK. The second priority was the continued electrification at 1500 DC, on the PLM, the Est and the Nord.

However **Louis Armand**, the post war General Manager, was interested in using 25 KV AC, which is the national power supply. The advantages of this are that you can bring “the EDF grid to the loco” (EDF is the French electricity company), reducing costs required for substations and for the heavier DC electric wires.



*A BB9200 pulling the 200 Km/h Paris Toulouse Capitole in 70's. Train set Pierre Meut and Edouard Staniczek*

Germany had tried 25kV on a test line in the Black Forest during the war. As this was in the French zone of occupation they continued the tests, and then used the mountain line from Aix les Bains to La Roche sur Foron in Savoie as an experimental line from 1950. The second line was the ore line from Valenciennes to Thionville in the North, and eventually it was shown that 25 KV transformed into a 50 Hz DC motor was successful and all lines have been electrified on that basis, other than extensions of existing electrification. It was only later on it was shown that it was more capable of running high-speed trains, and used for the High-speed train lines.

However electrification has only proceeded when the SNCF feels it makes economic sense to electrify the lines

As a result the lines South of Paris are at 1500V DC, while many in the North are at 25 kV AC. There are some isolated 25kV AC lines in the south as the Marseille to Ventimiglia on the Italian border. The High-speed lines are at 25 Kv AC.

## High Speed Trains

Although today SNCF is identified with high speed trains, the immediate post war policy was heavy slow passenger and freight trains, and while individuals may have been interested in speed, the SNCF only gradually decided that speed was a successful marketing tool, initially deciding that some lines could easily be upgraded to 200km/h running. In 1967 they introduced the 'Capitole' - a 200 Km/h train that ran between Paris and Toulouse (actually only running at this speed on limited stretches).

The next major was concentrated on Gas Turbine trains, original built on autocar frames with the successful ETG Gas Turbine units (Elément à turbine à gaz) introduced in 1969 on the Paris – Cherbourg Service, and the later RTG (Rames à turbine à gaz), and the first prototype of the TGV was a gas turbine. It was the shock of the oil price rise in 1974 that persuaded the SNCF to electricity, together with the experience of the Japanese with the bullet train.

SNCF decided to build a network of High Speed lines, linked to the conventional network, so that trains could carry on using the conventional network to their destination.

The justification for the first LGV line (Ligne à Grande Vitesse) – **PSE (Paris Sud Est)** was that they had to duplicate the existing line because of capacity problems

anyway, and the line was self financed by the SNCF. It came into full service from Paris to Lyon in 1983, quickly becoming successful and decimating the air traffic between these two cities, and paying for itself within ten years.

The second, the Y shaped **LGV Atlantique** from Paris to Courtalain to Mans in 1989, with a leg south from Courtalain to Tours in 1990. The TGV Atlantique is linked to the TGV PSE by a conventional line bypassing Paris to the South with a new station at Massy.

The Third is the **LGV Nord Europe**, reaching both Lille and Calais in 1993, a bypass to the East of Paris via EuroDisney and Paris Charles de Gaulle in 1995 to the TGV PSE. The bypass around Lyon via Satolas (Lyon Airport) was completed in 1994, and the **LGV Méditerranée** to Marseille opened in

### Le Weekend

The French have taken to the weekend with alacrity, and it is common for Parisian families to have second homes in the country, and to go out to them on the TGV on Friday and back on Sunday

2001.

The first stage of the **LGV Est** to Strasbourg should open in 2006.

Once they leave the TGV tracks, the trains carry on the conventional network, ending up sometimes on single track lines to holiday destinations, particularly on weekend services, or even hauled by diesel. The TGV Med for example particular crawls its way along the Mediterranean coast to Monaco.

### The Paris RER

The second major theme in rail transport in France has been the development of the RER Réseau Express Régional network of suburban lines going thorough Paris. These are based on existing suburban lines, which are connected via tunnels with limited stops under Paris itself. The first line – the East West **Line A** was connected in 1977, together with the extension of the suburban Ligne de Sceaux to Châtelet to form **Line B**.

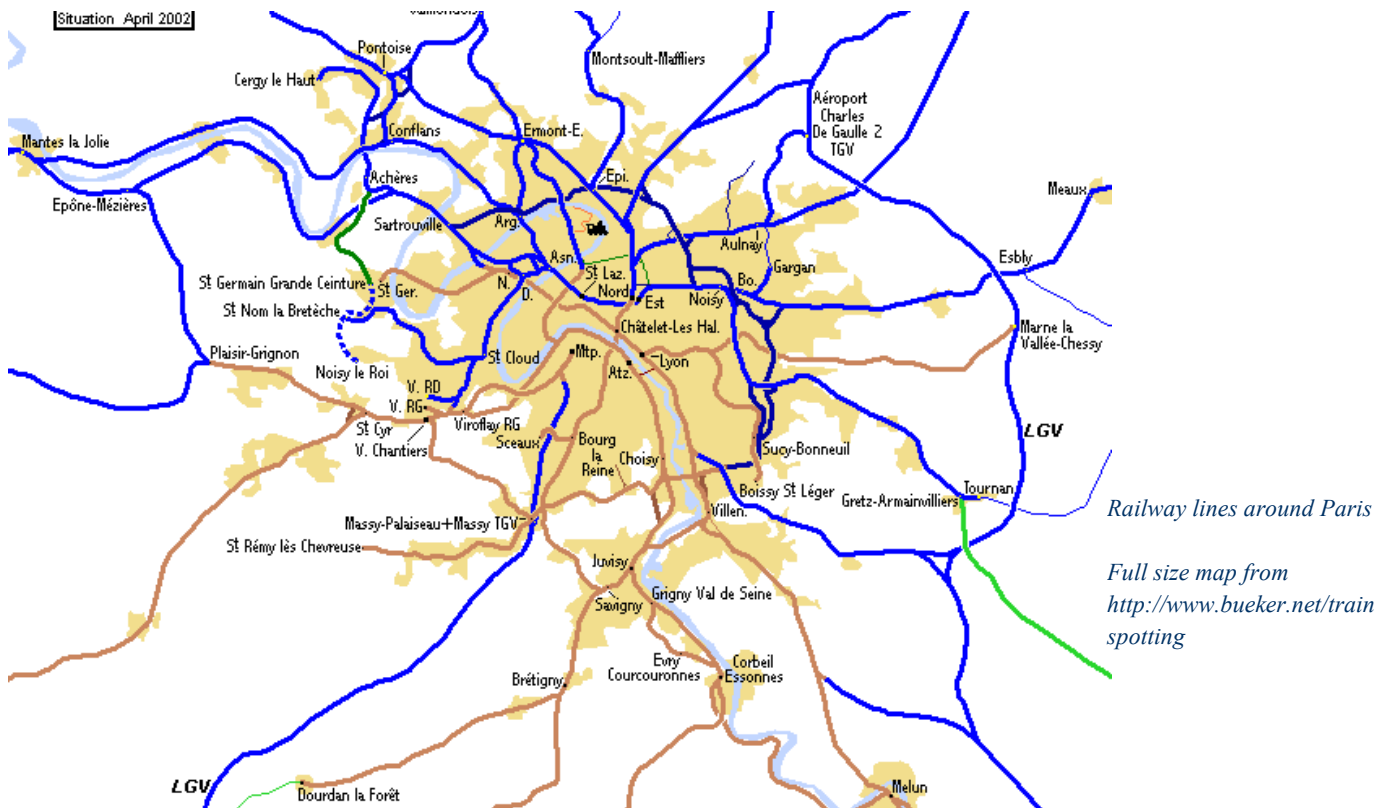
Line B was later extended to the Gare du Nord and in 1983 Charles de Gaulle Airport, with a branch to Mitry. Lines A and B are run by the RATP who are responsible for the Metro, Buses and Trams in Paris, except for the Cergy branch and the branch to Charles de Gaulle airport which are on SNCF lines. All the tunnel sections are 1500V DC, but the SNCF lines are electrified at 25kV AC and thus needing dual voltage EMUs.



**Line C** was formed by linking SNCF lines along the left bank using the old passage from Austerlitz to the Quai D'Orsay and on to Invalides.

**Line D** is an extension of the SNCF suburban lines from the Gare du Lyon, into an underground station at Lyon, a new tunnel to Châtelet completed in 1995, then using parallel tunnels to Châtelet, Gare du Nord, and to the north of Paris (Ory la Ville).

The latest **Line E Magenta** is an extension of lines coming into the Gare de L'Est to an underground station near to the Gare St Lazarre. It was opened in 1999. The RATP lines have headway of two minutes (Line A) and 3.5 minutes line B, the SNCF lines less so. In general the RATP lines have been a tremendous success, the SNCF lines less successful with issues of reliability and strikes. Both have had issues with security (from Crime).



## Regionalisation

A feature in France, as in Germany, has been the transfer of responsibility for providing regional passenger services from the railway to the Regions. Regional railways in France were in a decline, with a poor image and aging stock.

From 1982 with the decentralization of powers to the Regions, the later could agree with the SNCF to provide better local services in return for funding, and in 1987 they branding these services **TER Transport Express Régional**. However, the relations between the regions and the SNCF were not the best.

As a result of a parliamentary bill, from 1997 seven regions piloted complete responsibility for organizing and financing the Regional railways with SNCF providing the service, and in the three-year all grew their traffic from between 6% to 20%. Since 2002 all Regions have complete responsibility for deciding the service and for financing these services (except for the Ile de France and Corsica). As a result there has been introduction of

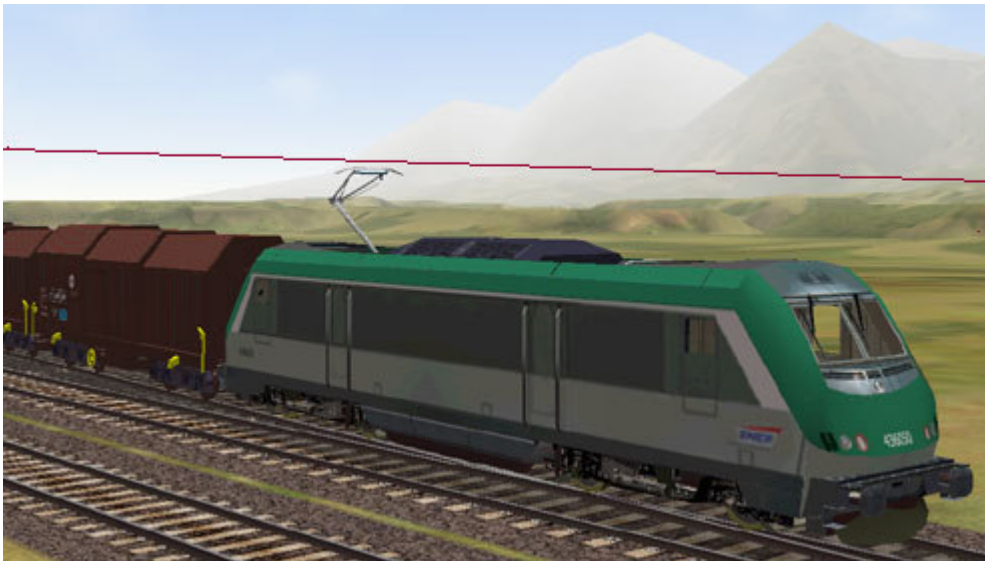
new stock, including double-decker EMU's and the refurbishment of older stock.

## RFF Réseau ferré de France

From 1997, due to EU laws the infrastructure for the French railways has been transferred to the RFF, who are responsible for financing and developing the network. The SNCF pays the RFF to run its trains on the network, and in turn they are paid by the RFF to managing and maintaining the infrastructure.

## Fret

As with other European railways SNCF has segmented, and with Fret (Freight) and infrastructure set up as separate activities. There has been considerable investment with orders places for new engine, both electric and diesel. The most obvious sign of segmentation is splitting up the locomotive park between the segments, and the new green color scheme for the Fret locos.



*A BB36000 in the Fret Livery, the Alps in the background.*

*Model: Claude Jousset*

*Signals at Chambéry station.  
The Nf means non franchissable  
(Do not pass if red)*



## Signalling

The French Railways use block signaling, with two simplified forms for less used or branch lines. For electric lights, in addition to the red, yellow and green, they have violet and white lights used for maneuvering signals.

The aspects of the signals, and their names are taken from mechanical signals, so for example the carré rouge (Red square), shown above is depicted by two red lights, and means absolute stop. The Etoile de Savoie route

described below has mechanical signaling from Evian to Annemasse.

The TGV's have in cab signaling –TVM Transmission *Voie-Machine* or "track to train transmission.

Normal trains (as well as TGV's) have in cab signaling KVB Contrôle de Vitesse par Balises, Speed control by (radio) beacon, which can apply the brakes if the train is going faster than the permitted speed, or disobeys signals.

### Signal sites

Luc Web LGV Med site has a page in English on signals

<http://perso.wanadoo.fr/lucweb/lgvmed/eng/default.htm>

TGVweb has an excellent page on the TVM <http://www.trainweb.org/tgvpages/signals.html>

Another site, in English, but with no graphics

<http://www.cerc.wustl.edu/~jpbs/transport/rail/signal/french1.html>

Thierry Davroux / Xavier Geillon have a superb site (in French) on all French signals at

<http://perso.wanadoo.fr/geillon/trains/index.htm>

## Classic Lines



*The Roundhouse at Chambéry.  
It is still in use.*

### Etoile de Savoie (Star of Savoie)

#### Version 6.0 Henri Verpiot

**Freeware** <http://perso.wanadoo.fr/henri.verpiot/>

Etoile (Star) is the French railway term for a network of lines around a point, in this case Annecy in Savoie in the French Alps.

The Northern border of Henri Verpiot's superb route is the 1500V DC line from Geneva to Bellegarde in France, and which would then go on to Dijon, or Lyon. The Geneva - Paris TGV takes this route. The SBB (Swiss Federal Railway) route from Geneva along the north of Lake Geneva to Nyon is also modeled. The Swiss lines run at 15kV 16.7Hz. See <http://bueker.net/trainspotting/> for which lines at Geneva station can be used by the French 1500 V DC trains.

The eastern edge is part of the 1500V DC line which runs from Modane on the Italian border to Chambéry, this line was originally electrified on a third rail system, and converted in 1976, and carries heavy freight from Turin in Italy. Chambéry itself is an important loco depot of the SNCF.

Within this frame is a star shaped single line network at 25 Kv AC centered on the beautiful town of Annecy, and extending to Evian on the south bank of Lake Geneva. Part of the line was used as the test bed for 25 kV AC electrification.

The area has extensive Regional (TER) traffic and also TGV traffic, particularly at weekends and in the winter.

The route allows prototypical running of a large variety of French stock, including:

- TGV's to Annecy, and Geneva, including those on the original orange scheme (which disappeared in 2001). The Thalys sets also go to Geneva.
- Freight, and other traffic to and from Italy, some from the Channel tunnel.
- The regular freight service from Evian in the North carrying bottles of Evian water, which has in fact probably kept this branch open.
- Push pull TER service from Lyon
- Z2 EMU's
- Sleeper trains to St Gervais, and less frequently to Evian
- The Ski trains in winter, with their variety of passenger stock

In addition, there is Swiss traffic on the SBB line from Geneva

Altogether an excellent route for train simming French railways.

[www.railsavoie.org](http://www.railsavoie.org) is a site on Railways in Savoie.





*Cannes station: not as glamorous as one might imagine – with a bypass built on top. The train is a X 72503 DMU in TER livery*

## **PACA 1.1 (Provence-Alpes-Côte-d'Azur)**

**Freeware: Modelfer**

<http://modelfer.com/>

The Marseille – Vintimille (Ventimiglia) Line along the Riviera coast was electrified comparatively late (in 1969), and at 25 kV AC. TGV's now rush down to Marseille, and then crawl for two and a half hours to Nice, or longer to the impressive new station built deep in the rock at Monaco. It is only towards the end that you get the sea views.

PACA covers a T around Cannes, from Antibes to Fréjus, with the short part of the T the Cannes to Grasse branch line. This was in fact closed to passenger traffic in 1938, but work is now being undertaken to reopen the line, as well as adding an extra line to parts of the coast line and other changes to improve capacity.

This route has TGV and heavy regional traffic; with new double-decker EMU's and older Push pull sets.

This route is not as polished as the Etoile de Savoie, but has possible more double tracks.

destination for Eurostar, and for other TGV's and trains carrying skiers.

## **RER B Claudius**

<http://claude.jousset.free.fr/>

The RER B suburban line in Paris, run by the RATP with the single-decker MI 79 stock.

## **Ligne C RER Patrick Fabard**

<http://perso.wanadoo.fr/patrick.fabard/index.htm>

The SNCF RER C line, which uses the double-decker stock.

## **Ligne de Roussillon Thierry Vaillant**

<http://pageperso.aol.fr/vaillant%20thierry/index.htm>

Roussillon is the South East part of France the other side of the Pyrénées from Barcelona. The line depicts Perpignan south to Banyols sur Mer. In addition to holiday and local traffic carries international traffic from Barcelona.

## **Other French Routes**

I have not reviewed the following French Routes

### **La Tarentaise V3 Miceal**

<http://membres.lycos.fr/voieferree/Sommaire.html>

The Tarentaise is the area below the Etoile de Savoie, and includes Bourg St Maurice, an important winter



*Charles de Gaulle Airport TGV station, which it shares with the RER line B, with an RER MI 79 EMU in the background*

## LGV lignes à grandes vitesses- High speed lines

**LGV Nord Europe Simulator tracks Payware**  
[www.simulatortracks.com](http://www.simulatortracks.com)

This depiction of the LGV Nord Europe covers the line from its three northern entry points of Lille Europe, Lille Flandres, the triangle to brushes and the branch line to Arras, to its southern ends at Paris Nord station and the bypass around Paris via Charles de Gaulle airport and Marne la Valle (EuroDisney). In addition it includes part of the RER lines B and D out of Paris.

This line therefore allows prototypical running of the Eurostar, Thalys PBA and PBKA from Brussels, Amsterdam and Köln (Cologne), as well as TGV services to Lille and Arras. Prototypical running of Line B and D RER stock is also a bonus.

Unfortunately, it is also one of the poorest routes in terms of detail that I have, and in comparison to Luc's LGV Med, or the payware German routes it is extremely disappointing, with Arras station (where I lived), and the

Gare du Nord in Paris particularly badly depicted. For a large part of the route the line runs parallel to the A1 motorway, although you would be hard pressed to know. Altogether a disappointing effort.

## LGV Med Luc Freeware

<http://perso.wanadoo.fr/lucweb/lgvmed/fr/>

Luc's superb LGV line from Valence to Marseille is rightly recognized as a world-class route, and doesn't need anything more from me on this subject. I was fortunate enough to have to travel frequently from Lyon to Bourg de Peage, just next to Valence TGV station, just as the line opened, and the depiction of Valence TGV is really right on.

### Other payware LGV Line not reviewed.

LGV Nord Europe from Lille to Brussels  
[www.simulatortracks.com](http://www.simulatortracks.com)

Just trains TGV (Updated version)  
<http://www.justtrains.net/> - From Ashford to Lille via the Channel tunnel and the LGV Nord



*Valence TGV station*

## Turbotrains

The TGV was originally envisaged as being powered by gas turbines derived from aerospace technology. Long before the TGV in 1970 the SNCF introduced TurboTrains, in what in retrospect is called the mini-TGV, on the non-electrified Paris- Caen- Cherbourg service. The line was chosen in part because it is a relatively short distance from Paris, but long enough for the people not to make the return trip in a day. Implementing the turbotrains brought a considerable increase in Traffic, particular in relation to the university at Caen, giving the name ‘Turbo Profs’ to visiting professors from Paris.

### T1000

The original Turbotrain was the T1000 ETGs Elements a turbine a gaz, of which 14 were built between 1969 and 1972. These are four set units with a turbo engine in one motor car and a diesel engine in the second (T1500). These were transferred to Lyon to serve in the Alps when the T2000 were introduced and withdrawn from service in 1999.

### T2000

The T2000 RTG Rame a turbine a Gas (Gas Turbotrain) were introduced between 1972 and 1976, and are a five car set with a turboengine at each end, although one is less powerful than the other. At the time, with air conditioning throughout it was an unprecedented level of comfort. In addition to Paris Cherbourg, they were used for Lyon Strasbourg, Lyon Nantes and Lyon Bordeaux. Following electrification of the Paris Cherbourg (1996) and Paris Strasbourg lines (1995) the remaining sets are used on the Lyon Bordeaux line.

Amtrak also used RTGs.



	T2000 RTG Rame a turbine a gaz	
Number	T 2001 –T2082	In use: 7
Built	1972-76	
Speed	160 Km/h	
Color	Orange/gray	
Use on	Paris –Cherbourg, Lyon –Nantes, Lyon-Strasbourg, until electrification and still on the Lyon-Bordeaux	

*Model: C Jousset*

## TGVs

It is now over twenty years since the first TGVs came into service, and in that time there has been considerable advances in Passenger comfort, including suspension and pressure sealing for tunnels, power and speed, which includes improved cab signaling systems for higher speeds, and in the latest the Duplex in aerodynamics.

The first TGV sets **TGV PSE** Paris Sud Est, were envisaged purely for high speed running from Paris to Lyon at 260Km/h, later 270Km/h, and not for any journey beyond three hours. All sets have now received new trailer bogies with better suspension. All sets have now been refurbished and repainted in Blue/gray, and the last orange sets disappeared in May 2001. Some sets have had TVM 300 and others TVM 430 to replace the original TVM 270

There are two sub-varieties of the TGV PSE, the tri current version for running on the Swiss system on the Lausanne to Paris TGV (Ligne de Coeur) and sets in yellow for the Post office. .

The second-generation trains starting with the **TGV Atlantique** are more powerful for 300Km/h or more, and the TV Atlantique has ten trailers, and a higher level of

comfort. **TGV R** Réseau (network) are similar to TGV A, but have eight car sets, and have less seats to provide better level of comfort on long journeys. There are also some three voltage system sets. The **TGV Thalys PBA** (Paris Brussels Amsterdam) sets are TGV R three-voltage sets with Dutch pantographs with the Thalys interiors and the Red/Grey Thalys color scheme.

The **Eurostar** has additional safety features to allow it to use the Channel tunnel, in particular the ability for the train to split in half, and be pulled out by one of the engines. This would not be possible in the standard TGV because the carriages share bogies. The Eurostar is in effect two sets comprising an engine and nine trailers put together. It is a four current set, with 750V third rail for use in the UK.

The **TGV Duplex** Double-decker sets are an answer to capacity overload on the Paris Lyon services, and by using aluminum they manage 45% increase in capacity for the same axle weights. The Duplex introduced the new aerodynamic cab. This is also used on the four voltage **PBKA** set (Paris Brussels Köln Amsterdam), which use the normal Thalys PBA type of trailer.



*TGV PSE Model: Clem Tillier Speedworks (model under development)*



	TGV PSE		TGVA	TGVR	Thalys		Eurostar	TGV Duplex
	Rénov1	Rénov2			PBA	PBKA		
Total Power kW	6300	6300	8800	8800	8800	8800	12200	8800
Built	1978-86		1988-91	1992-94	1996	1996-98	1992-93	1995-98, 2001-
No of carriages	8	8	10	8	8	8	18	8
No de motors	12	12	8	8	8	8	12	8
Type of Motor	Continuous		Synchronous	Synchronous	Synchronous	Synchronous	Asynchronous	Synchronous
Set Number	1 - 102 bi current 110- 118 tri current		301 - 405	501 - 550 Bi-current 4501 - 4530 Tri-current	4531 à 4540	4301 - 4307 4321,4322 4331,4332 4341- 4346	3001-3028 3101-3106 3201-3232 3301-3314 7 car sets	201 -264
Number of places	350	346	485	375	337	337	760	512
Speed limit km/h	270 (89 at 300)	300	300	300	300	300	300	300
Headlight	Set back	Set back	On cabin	On cabin	On cabin	Single Window	Single window	Single window
Signaling	TVM 300	TVM300	TVM300	TVM430	TVM430	TVM430	TVM430	TVM430
Color	Was orange now Blue et gray		Blue and gray	Bleu and gray	Red and gray	Red and gray	White with dark blue Window band	Blue and gray

In PSE sets the top headlight is in retreat. PBKA, Duplex and Eurostar have one centered windscreen. Some sets have been destroyed in accidents see TGV Web.

For full details of TGV's go to the excellent **TGV Web site**  
<http://www.trainweb.org/tgvpages/tgvindex.html>

*TGV PSE Ligne de Coeur Tri voltage sets built for the Lausanne to Paris TGV. Rebuilt in 1997- 99 with different interiors to the standard. Also now used to Zurich. The service has now been rebranded "Lyria." Model: Clem Tillier Speedworks (model under development)*





*TGV PSE Poste  
Model: Clem Tillier Speedworks (model  
under development)*



*TGV Réseau  
Model: Clem Tillier  
Speedworks*



*THALYS PBA Paris Brussels  
Amsterdam Tri voltage sets,  
identical to the TGV Réseau,  
for use on the Paris Brussels  
Amsterdam Route. THALYS is a  
grouping of SNCF, and the  
Belgium and Netherlands  
railways and Deutsche Bah  
Model: PBA at Geneva SBB  
station. Model Clem Tillier  
Speedworks*

*Surplus SNCF Eurostar sets were used on the Brussels Nice route but are now used on the Lille Paris route. These have had TGV logos on, and TGV door coloring, and now have the yellow nose painted gray.*

*Model: Chris Longhurst  
Repaint Denis Verheyden on  
[www.train-sim.com](http://www.train-sim.com)*



*A CC72000 fitted with Scharfenberg couplings pulls the Paris to Sable d'Olonne TGV on the non-electrified line from Nantes.  
Model CC72000  
Bruno Terrien*



*Thalys PBKA on LGV Nord-Europe*

*Engine: Pierre Meut, Belphegor, NewAlex, Clem Tillier, Edouard Staniczek Repaint Myself using skins from Clem Tillier Thalys PBA.. Train Clem Tillier.*

## Resources

The to major references consulted were:

[www.train-rail.com](http://www.train-rail.com) In French a veritable multimedia encyclopedia of French trains with full side plates of paint schemes, photos and videos – highly recommended even if you don't read French.

David Haydock & Peter Fox *French railways Locomotives & Multiple Units* Platform 5 1999

Brian Patton Paris *RER Handbook* Capital Transport 2001

Clive Lamming *Cinquante ans de traction a la SNCF* CNRE editions 2002

### MSTS Sites

French MSTS sites are fragmented, with many modelers maintaining their own sites. You should be able to find most models through these three sites of on [www.train-sim.com](http://www.train-sim.com)

**Simtrain** <http://www.simtrain-fr.org/>

**Le Train simulator Francais** <http://www.simtrain.dyndns.org/french/depot.htm>

**Pierre Gauriat** has a page on his site listing all original French material <http://ajtrainsim.free.fr/materfr.htm>

### Next Issue:

**French Locomotives, including classification, uses and color schemes**

Thanks to Boris for corrections.