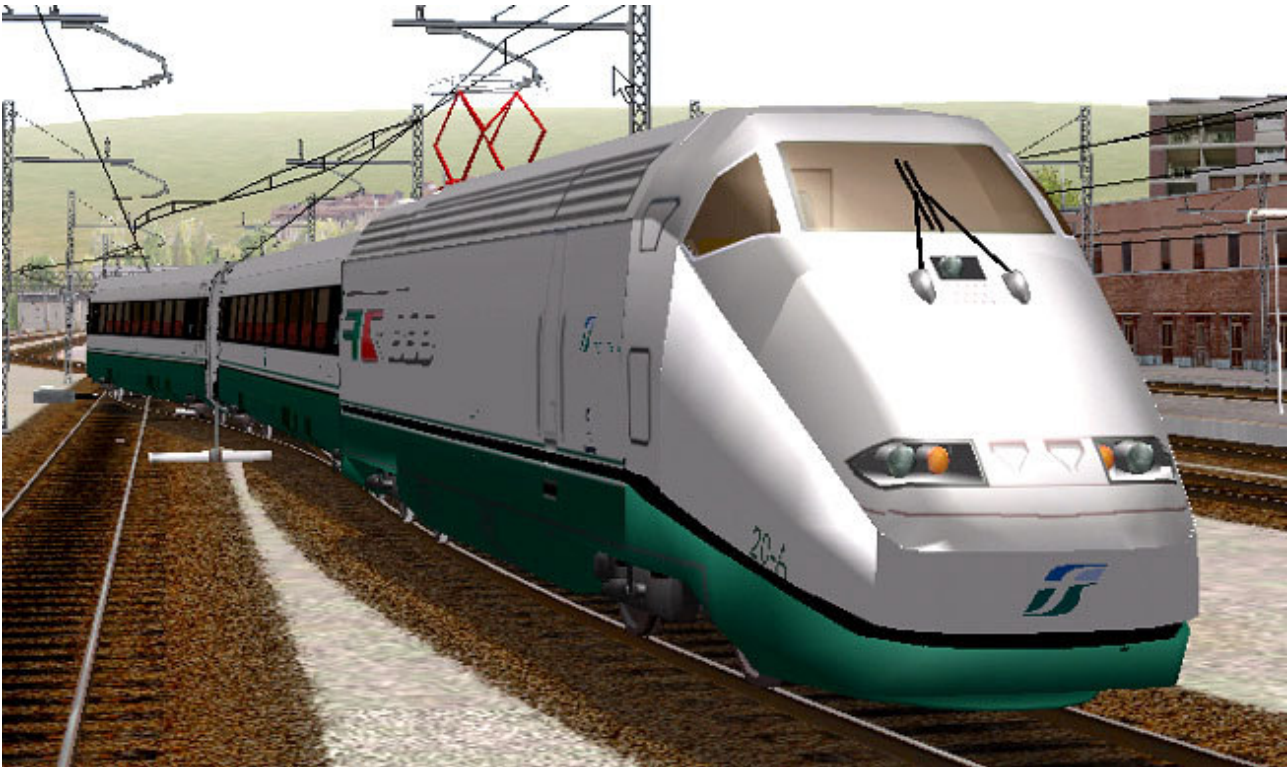




TRAINSIMMING MODERN ITALIAN RAILWAYS

Part Two June 2003



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- High Speed trains
- Colour schemes system
- EMUs
- DMUs
- Express Coaching stock
- Regional Coaching stock
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ETR Elettrotreni Electric High speed trains

The Italian railways developed high speed EMU's in the 1930's, with the ETR 220, "Polifemo" developed in 1936 and capable of 160 km/hr (100 mph).

Elements of these trains continued in service until 1998, with major refurbishments in the mid 60's so they go to 180 km/hr and late eighties, although their golden age passed with the introduction of the Gran Conforto carriages at the beginning of the 70's.

Italy is perhaps best known for its tilting trains, the Pendolini, which are ideally suited for its sinuous routes. Fiat developed its first prototype in 1971, which showed it could take curves at up to 30% faster than a conventional train.

The four car ETR 401 went into service as a one off in 1976 between Rome and Naples.

ETR 450

However FS were never whole-heartedly behind the project and did not do much until decided to restart the project in 1985, when they developed the ETR 450, using a combination of the existing Italian technology and technology that had been bought from British Rails abandoned APT project.

The ETR 450 has master tilting controls in the two end carriages that control the slaves in the other carriages, whereas the 401 had gyroscopic controls on each bogie.

The ETR 401 and 450 are genuine EMU's with motors spread throughout the train to balance the weight, particular when taking corners.

The Picture above is an ETR 500 Monotensione Model Ciro Di Donato e Salvatore Valesè

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An **ETR 240**. Built before the war as ETR 200, 14 sets were rebuilt in the late eighties as ETR220 1st and 2nd class or ETR 240 (1st class only). In use until 1998, and now used for charter.

Model: Michele Sacco

The **ETR 460** was built in 1993 as an update to the 450 although it has the same top speed.

The **ETR 470** trainset is a dual-voltage version the ETR 460 Pendolino. It operates the "Cisalpino" trains on the Zurich - Milan - Florence, the Geneva - Milan - Venice and on other routes. Automatic switchover is provided between 3000 V DC

(used in Italy) and 15 kV, 16.67 Hz AC (used in Switzerland).

The **ETR 480** are designed to be to be used as dual voltage 3000 V DC and 25 kV AC 50 HZ for use on the new High-speed lines.

ETR 500

The ETR is not a tilting train but a conventional 300 km/h high-speed train like an ICE One, or a TGV Réseau with an engine at

each end of the train. It is designed for high speeds on the new High-speed line between Milan and Naples. The first series of 30 trains were only 3kV DC, the others designated **P "Politensione"** are capable of 25kV AC used on the high-speed lines.

The High-speed trains have been given the branding **Eurostar**

Class:	ETR.450	ETR.460	ETR.470	ETR.480	Cisalpino, a joint venture between FS, SBB and BLS, own the ETR 470.
Number	15	6	9	14	
Built:					
Built:	1987- 92	1996	1996 - 1997	1997 -1998	
Voltage:	3kV DC	3kV DC	3kV DC 15kV AC 16.7 Hz	3 KV Dc	The ETR 480 are designed to be reequipped with 25kV AC for high-speed lines. Use: The 7 Pendolini are on high speed trains between Milan-Rome-Naples
Speed:	250	250	200	250	
Max Cont power	5008kW*	5880	5880	5880	Three ETR 460 were equipped with 3000V/ 1500V DC Dual Voltage sets was for services on Torino-Lyon, but service was withdrawn from the route because of continuing problems
Axel Number	EMU-9 15	EMU-9 6	EMU-9 3	EMU-9 14	
Colour schemes:	Red and white. The Cisalpino are Blue and white.				
*Nine car set					

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An ETR 450 Model: Salvatore Valesè

	ETR.500	ETR.500	ETR.500P	ETR.500 P
Class:	ETR.500	ETR.500	ETR.500P	ETR.500 P
Number Built:	20	10	20	10
Composition	D+9+D	D+6+D	D+11+D	D+8+D
Built:	1992 -	1992	1992 -	1992
Voltage:	3kV DC	3kV DC	25kV AC 3kV DC 1500 V DC	25kV AC 3kV DC 1500 V DC
Speed km/h:	300	300	300	300
Max Cont (Train)	8800 kW	8000 kW		

The ETR 500 Monotensione and the ETR 500 P have different front designs.

The ETR 500 Y was a prototype



An ETR 460. Model: Ernesto Imperato












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An ETR 500 P Multisystem – showing the different nose design and colour scheme

Model Vittorio Dell'Aquila, Michele Sacco (Not entirely correct as based on the Kuji Amtrak model)

Colour schemes

ALe 601	1954	Light gray with Magnolia green window ands and doors	ALn 601
ALn 668	1958		All members of the 663 and 668 family
ALe 803	1963	Bordeaux Red and sand -yellow.	
ALe 801	1975		
XMPR	1996		All EMUs and DMUs
Gran Conforto	1972		For Gran Conforto stock, with a thin red stripe under the windows. Also used initially for Z stock, with a thin blue window band
MDVC	1980		On MDVC stock; ALe 724
Type X Bordeaux and gray	1982		On type X stock.
MDVE	1984		On MDVE stock; ALe 582, ALe 582, ALe 642, ALe 841
Type Z Bicoloured gray	1989		Type Z stock
XMPR Long distance	1996		All long distance stock. There is also a version with wide blue bands used on UIC-X stock
XMPR Regionale	1996		All Regionale stock
XMPR Couchette	1996		

EMUs

Class:	Ale 426/ Ale 506	
Number	80	
Built:		
Built:	1998	
Voltage:		
Speed:	140 km/h	
Multi:	2 sets	
Push Pull:		
Number		
Passenger:	80	

Colour schemes: XMPR

Use: Modern double deck EMUs "TAF" (**Treno ad Alta Frequentazione**) used mainly for the Milan airport link, Rome airport link, and in some regional work.

Also used by the private railway **FNM Ferrovie Nord Milano**.

Composition 1 motor (ALe 506) + 2 remotes (Le.736) + one motor (ALE 426)

Model: E404 and Ernesto Imperato

Ale 840/ 724/ 582 / 642

The Ale 840 and Ale 644 GAI (Gruppo Aziende Italiane) were the prototypes for a family of EMU's, and the prototypes are still in service as ALe 644 + Le.844 +ALE 804 around Sulmona.

The production version was the **Ale 724** batch of four-car Class ALe724. The first 40 of the series work one line of the Naples Underground

The Ale 582 is an updated version, which has first and second-class accommodation. The ALe 642 is practically

the same as the Ale 582 is second-class with 64 seats. These have been constructed in 1991

They are found in the following compositions:

- ALe582 + Intermediate Le884 + Driving Trailer Le562
- Ale 642 + Intermediate Le 884 (or Le 764) + Driving Trailer Le682



ALE582 in MDVE scheme Model: Niels Picciotto

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Ale724 in MDVC scheme. Model: Niels Picciotto

Use: Suburban EMUs used in two or four car sets (with two trailers)


Class:	ALe 582	ALe 642	ALe 724	ALe 644/ Ale 804	Colour schemes
Number Built:	90	60	90	6	Ale 644/844: Specific Livery/ XMPR
Built:	1987 - 1989	1981	1982 - 1985	1978-81	Ale 582/ 642: MDVE (Red and Powder Gray); XMPR
Voltage:	3000V DC	3000V DC	3000V DC	3000V DC	Ale 724: MDVC; XMPR
Speed:	140 km/h	140	140	140	
Mac Con Power	1.260 KW	1.260 KW	1218 kW		



A First series 801. Model: Ernesto Imperato, Alessandro Sposito

Class:	ALe 801/ Ale 940	ALe 803	FS developed first the ALe 803, then the ALe 801 from the ALe 601, which was an express EMU.
Number Built:	65	53	
Built:	1975 - 1979	1961 - 1973	The Ale 803, used for suburban routes including the Napoli Underground from 1962 and 1975, and operates as a Motor set and two cars.
Voltage:	3000V DC	3000V DC	The Ale 801 have the same carriage and motor than the 803, but two entrances per carriage instead of 3, and a Orange and cream livery rather than Bordeaux and sand yellow. It has a capacity of 390 places to seat rather than 320
Speed:	150 km/h	150	
Multi:	To 3		
Max Cont power:	872 Kw	872 Kw	The Ale 801 was in two series Ale 801.001 – 025, and Ale 801.026 – 065; the series can be distinguished by the two small front windows of the first series.
Number Regional:	65	53	The ALe 801 Used for Suburban routes, from Rome, and in most of Italy, including Sicily from 1998 on the lines Messina - Siracusa, and Messina - Palermo, once they were replaced in Rome by the TAF. Operate as two motors and two cars.
Colour schemes:	Orange and cream (801); Bordeaux and Sand Yellow (803); XMPR		
Use:	801 Suburban EMUs used as ALe 801 +2 trailers Le 108 + ALe 940 803 Suburban including Naples underground ALe 803 + Trailer plus driving Trailer		

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Class:	Ale601	Ale841	
Number	67	10 R	
Built:			
Built:	1961-72	1995-R	
Voltage:	3000V DC	3000V DC	
Speed:	180 km/h	160 km/he	
Multi:			
Push Pull:			
Number			
Passenger:			
Cargo:			
Colour	Ale 601 Grey and Green		
schemes:	Ale 841: MDVE (Red and Powder grey) XMPR		
Use:	Express motor coaches used with trailers The ALe 841 are rebuilt ALe 601 used in Sicily.		

The **ALe 601**, constructed in two series (001-045 and 045-065) between 1961 and 1972, provided air conditioned first class, elevated comfort at speeds to 200km/hr on important expresses such as the " Freccia della Laguna (Arrow of the Lagoon) " between Bolzano, Trieste and Rome and " Tirreno" between Turin and Rome.

The introduction of the ETR 450 and ETR 500 means they are no longer required for this, so that they are being refurbished and reconverted for regional service as the **ALe 841** four coach sets, with the speed being reduced to 160 km/h.

The first two trains, with an a colour scheme similar to MDVE carriages initially circulated between Florence and Rome and between Rome, Pescara and San Benedict of the Toronto, but were then assigned to Palermo (Sicily). The next two sets in XMPR livery took on the service between Rome Termini and Fiumicino (Airport).

Ale 801 Model: Ernesto Imperato, Alessandro Sposito

Retired EMUs



Ale 840 on the Brenner July 1997 Model Mr Rokko

At the start of the nineties FS still had a variety of EMUs built in the fifties, in their Brown scheme, which were in service until the late 90's, including ALe540 and the similar looking ALe 660, the ALe 790 and the similar ALe 880, and the ALe 840 illustrated above.

The **ALe 840** were built between 1950 – 1954 with a top speed of 150 Km/h and used with Le 840 Trailer. The last survivors carried out region duties on regional trains between Bolzano, the Brennero and the Val Pusteria

DMUs and Rails Cars

ALn 668 ans ALn 663

The only family of diesels in service, with the first members of the family introduced in the 50's.

They are born therefore the first ALn 668 produced by Fiat (series 1400) and Breda (series 2400).

The 1200 series, constructed between 1979 and 1983, have aspirated motors, with exhausts on the roof.

The 3100 series 1200 have turbo compressors, and can controls for Multiple operation of up to Three units, although it seems possible to work two sets of up to six units). The last series the 3300 has gears adapted to the steep Appennine lines.

From 1983 the ALn 663.1100, was introduced, which is mechanically

similar to ALn 668.3100 but with more modern carriage design, and more comfortable furnishings.

All units are receiving air conditioning in the course of refurbishing, when they are also painted in the XMPR scheme.

Class	No Built	Year in service	Max Speed km/h	MU	No in service	
ALn 663	120	1983-1986	130	To 3		Based on the ALn 668; 400 will be built. First 16 only 110 Km/hr
ALn DAP	5	1997	120			Based on ALn 663, used for transporting prisoners
ALn 668.1000	120	1976 -79	120			Identical and built after the ALn 669
ALn 668.1200	60	1979 -80	110			Lower powered version of ALn 668 used around Treviso
ALn 668.1200	10R	R	110			Rebuilt ALn 668.12 with new engines
ALn 668.1400	80	1956 -63	110			
ALn 668.1500	75	1965 - 67	110			2nd generation ALn 668 used in the North of Italy. Also 23 Trailers with Driving cabs built Ln882.1501-1523
ALn 668.1600	33	1970 - 71	110			Similar to ALn 668.15 used in Sicily
ALn 668.1700	20	1971 -72	110			Similar to but different engine to ALn 668.16
ALn 668.1800	85	1971 -73	110			Similar to ALn 6617
ALn 668.1900	42	1975 -1976	130			Third Generation of ALn 668
ALn 668.2400	40	1959 -64	110			Particularity of this series: numeration 2401-2430 has the external bellows of intercommunication, while the 2431-2440 sluices from frontal doors
ALn 668.3000	40	1980 -81	130			Similar to ALn 668.1 used in Sicily
ALn 668.3100	150	1980 - 8381	130	To 3		Version of ALn 668.3 suitable for Multiple Unit operation.
ALn 668.3300	40	1982 -83	130	To 3		Final version of ALn 668, being refurbished for Abruzzo region

See <http://treni.valdelsa.net/schede/aln663.htm> or 668 for full technical details

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An Ale 668 D.A.P. (Dipartimento amministrazione penitenziaria) used for transporting prisoners

Model: Mr. Rokko/Repaint Ernesto Imperato



Two ALe 668 1822. A bellows gangway joins them. Model Mr Rokko

Retired Railcars



Two ALn 883 Model Giacomo Mileo

Also in use in the early nineties, and based at Verona, were the ALn 773 and the similar ALn 873 railcars (the main distinction being the curve windows of the ALn 883).

Long Distance Coaching Stock



UIC X in the Bordeaux and Light Gray, with one coach still in the original Slate Gray 1997 Model Fabrizio Mungai

UIC X

The largest series of coaching stock with about 4200 built from 1966 to 1987, developed from a German design, to meet the UIC X standard (Union Internationale des chemins de Fer) for international trains. There are numerous with numerous technical and aesthetic differences between the series built in this time. Initially used on the more important and international trains, they are now used on trains of all categories from Intercity to regional.

Types; A, B and AB Coaches; Couchettes; Restaurant cars; Baggage Cars

Max Speed 160 km/Hr, some modified for 200 km/hr

Colours: They introduced the slate gray scheme still to be seen in the 90's; from 1982 the Bordeaux/Gray

scheme; Currently XMPR with two different schemes, one with a larger blue window band, and the other majority light gray with a small green skirt with a thin blue band above; XMPR Couchette

UIC-X IR (Rebuilt)

The UIC X are now currently being extensively refurbished for use on Inter regional with air conditioning, new seats, and losing the characteristic door, to a more modern one.

In addition some coaches are being transformed into driving trailers (Semipilota), with a lower front section for handicapped access. These driving trailers are being used with other regional stock in addition to the UIC-X carriages.



UIC-X Coach transformed into a Driving cab, with entrance for disabled, with Low floor stock, Torino 2000. Model Pek.

Gran Conforto



A E 402 A pulling an Intercity in the original Gran Conforto scheme April 1997
Model Spanish team; Repaint Fabrizio Mungai

Built from 1972 in limited numbers, as the name indicates with a high level of comfort, including air conditioning for First class passengers on important trains, with speeds of 180 km/hr, later authorised to 200 km/h.

They are recognisable by their cream and gray scheme, with two thin red lines above and below the cream.

As far as I am aware they were not used for International trains, but I was not able to obtain much information on these coaches.

UIC Z



Z Stock in the Two-tone gray scheme. Model: Pek; Repaint Nello/ PCZ

The Z class, built to the UIC standard, provided the FS with the ability to run trains at 200 km/hr with medium levels of comfort, including air conditioning. Built from 1985 until the early nineties.

Initially they had the same colour scheme as the Gran Conforto, but with a thin blue band, but from 1990 they were delivered in a Two-tone gray scheme, which has now been replaced with the XMPR scheme.

From 1999 thirty-five Z1 class Driving trailers were delivered, allowing push-pull operations at 200 Km/hr.

Speed: Z1 maximum speed 200 km/h, Z2 (maximum speed 160 km/h,

Colours Gran Confort (with thin blue stripes); two-tone Gray; Eurofirma orange, XMPR



A new Z1 Semipilota (Driving Trailer). Model: Mr Rokko

Regionale

MDVC/MDVE (Medie Distanze Vestiboli Centrali) and (Medie Distanze Vestiboli Estremità)



MDVC – With Full driving cab. Model Mr Rokko

Two classes, in service from 1981 for push-pull medium distance work and sharing the same chassis, but with one (MDVC) having the entrances (Vestibules) at a third and two thirds along the coach, and hence three compartments, whereas the MDVE has the two doors at the far ends (extremity) of the coach, and one compartment with a door half way through.

The former is used more for suburban work, and the later for direct and interregional services.

MDVC half are B and AB coaches (ie mixed first and second class), and MDVE first and second class coaches. In addition there are MDVE sleeperette carriages with reclining seats distinguished by a different livery. All

are currently being refurbished and equipped with air conditioning.

There are three types of driving cab, each with a small baggage compartment:

- Half cab with a through corridor exit at the end, used for shorter distance work (in MDVC livery)
- A full elevated cab at the end used with electric locomotives (in both MDVC and MDVE livery) with baggage compartments
- The same as (B) used with diesel locomotives.

In addition with diesels there is a heating car to provide electrical heating for the carriages.

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MDVE Driving cab. Note that on the carriages the doors are at the end. Model Mr Rokko



MDVC with Half Cab with Passenger gangway. Notice the Bike in the train. Model Mr Rokko.



MDVE Sleeperette, with reclining seats, in the original livery. Model: Johnny

Colours:

MDVC: Violet with Orange doors, thin orange and viola strip below window. Now XMPR

MDVE: Power Grey with Fire red window bands, with thin orange strip below window, now XMPR

MDVE Sleeperette Wide Mid blue window bands with orange stripes underneath.

APR (A Piano Ribassato): Low Floor stock



Rib Stock with the Half Driving cab, with Gangway access. Model: Hans Engler

Introduced in 1973 in Milan, the low floor stock has, doors at a third and two thirds along the coach, with the doors and the central compartment at a lower level, allowing easier access at stations with low platforms, and hence reducing loading times. . There are two series with slightly different door designs

There are two types of Driving cab, one with gangway access to passengers. In addition the UIX-X driving trailers are also used with this stock.

They are currently being refurbished with new seats, and air conditioning, with the pod on the roof.

There are pulled by a variety of locomotives including the E646 and the new E464.

Colours: Slate gray (original); MDVC; XMPR.

ADP (A Due Piani): double-deck cars



ADP Driving cab, in original MDVC scheme. Model Grandi Officine Trenomania

For high frequency push-pull work, particularly where there are short platforms, the FS uses Double deck stock with a driving cab at the end (without a baggage

compartment), with a typical formation being an E464 and three coaches including the driving cab.

Colours: MDVC; XMPR (mostly white with thin bands)

1959 stock



1959 stock, seen here with an E424 in 1995, was used in regional trains until the late 90s

Model carriages Renzo Grassi

Resources

MSTS

<http://www.trenomania.it/> A Major site for routes, and stock. Has a Quality Control system

<http://www.allfreenet.it/train-simulator/> All Free Net – another large selection, but duplicates some of above.

<http://digilander.libero.it/pek317/> Pek's site

Railway

<http://www.miaferrovia.it> Excellent site for Technical details

<http://www.solotreni.net/> Good site for pictures

Tutto Treno Tema 18 *Ferrovie Italiane Anni '90* January 2003

The Number in Use came from the stock tables at the European Rail server <http://mercurio.iet.unipi.it/list/italy.html>

Others in the series

Trainsimming Modern German Railways (Three Parts)

Trainsimming Modern French Railways (Three parts) (Also in French translated by Ces Price)

Trainsimming Modern Swiss Railways (SBB and BLS).

From www.trains-sim.com www.thetrain.de and www.trainsimfrance.net

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