



Trainsimming Modern Hungarian trains

January 2005



A MAV V43 modernised with UIC jumper leads for push-pull working in the revised MAV livery with an MDmot DMU at the (imaginary) Sasvar station 1999.

- **Background to Hungarian Railways**
- **Hungarian locomotive numbering system**
- **Electric locos**
- **Diesel Locomotives**
- **EMUs**
- **DMUs and railcars**
- **Coaching stock**
- **Signals**
- **Routes**

I feel that Hungarian MSTs models are some of the finest around, but until fairly recently I could not find any Hungarian routes to run them on.

The situation has now changed, with some World-class routes are now available.

In contrast to the Czech and Slovak trains we looked at last time there is less variety in motive power.

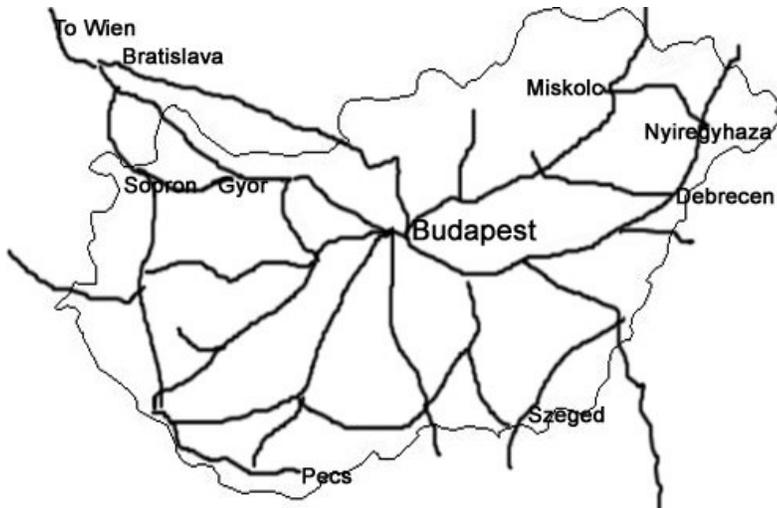
However Hungary has two Railway system, **MAV**, and the smaller **GySEV** which links one of the routes between Hungary and Austria

Hungary is a landlocked country the size of Indiana with a population of just over 10m. It was part of the Austro-Hungarian Empire, when its size was significantly bigger, and there are significant Hungarian populations in the surrounding countries. It was behind the iron curtain, and is now a member of the EU.

About one-third of the urban population lives within the Budapest metropolitan area, which is several times the size of other major cities. The major provincial centres are Miskolc, Debrecen, Szeged, Pécs, and Győr, each of which has a population exceeding 100,000.

Essentially a flat country – the famous Hungarian plains, with the Danube running through it North to South. The other major river is the Tisza.

Hungary lies on a major transport link between West Europe and the East.



Total Railways: 7,875 km
 broad gauge: 36 km 1.524-m gauge
 standard gauge: 7,620 km 1.435-m gauge (2,628 km electrified)

For a detailed map of the Hungarian network see <http://www.bueker.net/trainspotting/maps/hungarian-network/hungarian-network.gif>

The first steam railway opened from Budapest in 1847. The first National Rail policy was in 1848, which proposes four main lines from Budapest, in a rough X shape. The Hungarian Royal State Railways, now **Magyar Államvasutak (MÁV)** was formed in 1868 by buying a bankrupt Railway company, and many lines were nationalised at the end of the 19th century.

The first line to be electrified was a branch line in 1911, but the first major section out of Budapest was electrified in 1931 at 16 kV 50 Hz, although all lines have been converted to 25 kV AC from 1960. Most but not all the major lines are now electrified.

The **Győr-Sopron-Ebenfurthi Vasút (GySEV)** (known in German as the **Raab-Ödenburg-Ebenfurter Eisenbahn (ROeEE)**, as the name suggests was set up to build a railway from Győr to Ebenfurth in Austria where it joined the Südbahn and linked to Trieste thus allowing the export of Hungarian wheat, or to the West avoiding Wien. Following the First World War, it was owned by both Governments, and until recently ran as an Austrian Department, and a Hungarian department. The line was electrified in 1988. There is a branch line Neusiedl am See - Fertőszentmiklós - (Neusiedler Seebahn), and in 2002 they took over from MÁV the right to use the Sopron-Szombathely. Both these lines are now electrified.

GySEV run Intercity trains from Budapest-Sopron, and Sopron to Wiener Neustadt, and Regional trains on their own lines. They have extensive freight activities, with growing Intermodal traffic. Sopron is a major freight terminal with

both MÁV and GySEV Traffic. The GySEV RoLa traffic has declined, particularly as now that Hungary has joined the EU border controls are easier.

GySEV Locomotives and carriage stock are Grass green with a yellow band.

Locomotive numbering system

Diesel engines have a letter "M" as first character in the class number; Electric locos a letter "V". The number of driven axles and a class designator follows this. Thus **M41** is a diesel engine with 4 driven axles (actually BB), while **V63** is an electric engine with 6 driven axles (actually CoCo).

For diesel electric engines the second group of numbers contains 3 digits. For diesel-mechanic and diesel hydraulic engines it is composed from 4 digits, where the first digit is **1** for diesel mechanic engines and **2** for diesel hydraulic engines. Thus **M41.2015** is a diesel hydraulic engine with four driven axles. For electrics Sub classifications or rebuilds start with a new block eg V43.2036.

The first diesel engine was M44 instead of M40. The M40 is a later engine. There is also a gap between V60 and V63: with no V61 or V62. This is probably made to indicate the design similarity between M63 and V63.

There are plans to re-classify stock using a 4-digit class system that so far has only appeared on the Siemens Taurus 1047 (similar to ÖBB 1116) and new DMUs.

Electric Locomotives

Class:	V43	V43.2
New	1143	1243
Class:		
Number	1963-82	1999
Built:		(Re)
Number	379	30 (Re)
Built:		
System:	25kV	25kV
Speed:	130	130
	km/h	
Power	2200kW	
Multi:		
Push Pull		Yes
In Use:	316	30
GySEV	15	



The main Electric motive power in Hungary. Designed by a consortium including Krupps and Alstom to meet a specification of MAV, with most assembled and built in Hungary. The original bogies damaged poor track, so most have been rebuilt with new rubber suspension, and 30 have been modified for push-pull operation and the central closing of the doors. These are renumbered as V43.2360 and have a new livery.

GySEV bought 15 from MAV between 1987 and 1998, when they electrified their line.

One of the 15 GySEV V43s. Model HLF Repaint Zsivány

Class:	V46
New	1046
Class	
Number	60
Built:	
Built:	1983 -1992
System:	25kV
Speed:	80 km/hr
Power:	800kW
In Use:	60



Station pilot, Heavy Electric shunter or Light freight with thyristor rectifiers.

V63 on pilot duty at Sasvár (Fantasy). Model Ganz Mávag VM15

Class:	V63	V63.2
New Class	1063	1163
Number Built:	56	10 (Re)
Built:	1974- 88	
System:	25kV	25kV
	Co-Co	Co-Co
Speed:	120 km/h	160km/h
Power:	3700 kW	3700 kW
Multi:		
In Use:	43	9



The ‘Gigant’ is a Co-Co electric locomotive with thyristor rectifiers introduced in the mid-eighties for fast and heavy passenger trains and heavy freight trains. Ten have been upgraded for 160 km/hr work and renumber in the V63.100 series. V63.106 was downgraded. However, as they cannot sustain 160 km/hr EC trains to Wien used Austrian locos equipped for working in Hungary.

V63 with EC stock. Model: HFL Factory

Class:	1047
No Built:	10
Built:	2002
System:	15kV
	/25kV
Speed:	160
	Km/h
Power:	6400
	kW
Multi:	Yes
In Use:	10
GySEV:	5



Siemens built dual voltage locomotives similar to the ÖBB Class 1116 15/25 kV Taurus for high speed and cross border operation.

MAV and GySEV 1047 next to an OeBB 1116 at Budapest

MAV and GySEV 1047 Model Robert Zirknitze. OeBB 1116 ProTrain.

Diesel Locomotives

Class:	M28
New	2128
Class	2228
Number	24 / 10 (*)
Built:	
Built:	1955-1959
System:	Mechanic / Hydraulic (*)
Speed:	30 / 50 km/h (**)
Power	95.5kW / 174 kW
Multi:	
In Use:	19

** Shunter/ Normal



Very small two-axel shunter. Subclass M28.1 has a mechanical transmission and the more powerful M28.2 Hydraulic.

Model in old livery (Model: No read me)

Class:	M32
New	2232
Class	
Number	56
Built:	
Built:	1972-1974
System:	Hydraulic
Speed:	22 / 60 km/h (*)
Power	257kW
Multi:	
In Use:	10
* Shunter/ Normal	



Light Shunter

Model: Virtual Modelling Works

Class:	M40
Number	74
Built:	
Built:	1966-1970
System:	Diesel Electric
Speed:	100
Power	605kW
Multi:	
In Use:	27
GySEV	2



Built in Hungary to fill a gap because the M62s had no train heating equipment, and to hasten the switch over from steam. 20 still in use pulling freight and passenger specials.

GySEV bought two M40 locomotives were bought in 2001 from the MAV for the freight service/work trains on GySEV's new line Sopron-Szombathely

Model Virtual Modelling Works

Class:	M41
Number	74
Built:	
Built:	1973
System:	Diesel Hydraulic
Speed:	100
Power	1320 kW
Multi:	
In Use:	107



Developed by Ganz from a design for the Greek Railways as a passenger engine with low axle loads for branch lines. Class M41 "Rattler" is diesel hydraulic" powered by a SEMT-Pielstick designed V12 engine. It contains a train-heating generator. The loco is underpowered for hauling more than 6-8 coaches

M41 coming out of (the fictive) Szir station just before moving on to the diesel only tracks

Model: HFL Factory

Class:	M43
No	160
Built:	
Built:	1974-1979
System	Hydraulic
:	
Speed:	30/60*
Power	331 kW
Multi:	
In Use:	83
	*Shunter/Normal
	Transmission



Rumanian built shunter and light freight locomotive.

Model: Virtual Modelling Works

Class:	M44
Number	200
Built:	
Built:	1954 -1972
System:	Diesel- electric
Speed:	80 km/h
Power	440 kW
Multi:	
In Use:	37
	36 Re
GySEV	12



Light shunter and Light freight. Very occasionally such engines haul Bzmot or MDmot trailers when the motor cars fail. Over 900 built, the majority exported for example to Slovenia, Poland and Serbia.

36 (M44.401-436) have been reengineered with Caterpillar engines, and can be recognised by a different exhaust layout. Another 30 have been rebuilt and renumbered M44.5.

GySEV have bought some second hand from MAV.

Model: Virtual Modelling Works

Class:	M47
New class	2147 2247 2447
No Built:	1974-1979
Built:	38 + 75 (*)
System :	Hydraulic
Speed:	35 / 70 km/h* *
Power Multi:	514 kW
In Use:	20 Re 41



* Without/with Train heating

**Shunter/Normal Transmission

Shunter and light freight, the majority some equipped with Train heating. The M47.1 (2147) sub series has a smaller (700 HP) engine than the M47.2 class (Class 2447) (950 HP). The M47.1 locos were not equipped with train heating generator. 41 Rebuilt with MTU engines (M47.1201-1222 (Class 2247) and M47.1301-1319). The latter with additional ballast weight, based at Győr and Miskolc.

M47 with Local Passenger train. Model VMW

Class:	M62	M62.3
New Class	2062	2362
Number Built:	2862	4 (Re)
Built:	M62.5 15 1965-78	
System :	Diesel-Electric	
Speed:	100	100
Power Multi:	1470kW	1500KW
In Use:	75 M62.5 9	4



The ‘Szergej’ Co-Co diesel built in the Soviet Union for standard gauge. Hungary would have preferred more of the Swedish built NOHAB of which they had 20, as a steam replacement, but were essentially forced to take the inferior M62 (in terms of reliability, noise and fuel and oil usage). Designed for freight, it had no passenger heating, so a separate wagon with a steam boiler, and later a diesel generator, were used to heat the passenger cars. Used for Passenger, and freight.

15 M62.5 were built for wide gauge. The GySEV also had 6 M62.9 until 1996 when they lost their permission to go into Austria. Four M62 have been rebuilt as M62.3 with a Caterpillar engine, and more are to follow.

Two M62s with a coal train. Model HFL Team Repaint (Zsivany)

Class:	BDVmot	4 car EMU for Commuter use in Budapest area. Consists of a Motorcar, coach and Driving trailer.
New Class	5040	BDVmot + Bmx+ Bmx+ Bmxt
No	20	
Built:		Three four car set BVmot were built in 1994 as prototypes for Intercity EMU
Built:	1998 - 1990	BVmot+Bmxz+Amxz+Bmxtz
System	25 kV	
Speed:	120 km/h	Two similar looking BVhmot (with a split windscreen) Class 5041 were built in 1995 as prototypes for a new class of suburban EMU.
Power	1520 kW	
Multi:	Yes	
In Use:	19	



Model: VMW

Class:	MDmot	Numbered as a DMU, but to the layman (eg me) more like a diesel loco (two cabs, engine above the solebar and no passenger accommodation) with two-three dedicated carriages and a Driving trailer (Btx). Used on branch lines.
New Class	2345	
No Built:	42	
Built:	1970-1975	
System:	Hydro-mechanical	
Speed:	100	
Power	590 kW	
Multi:		
In Use:	41	Model VMW.



Class:	Bzmot	Czech Built two axel railbus, often run with a trailer, as below. All have been reengineered in the mid 1990's with new 2+2 seating replacing 2+3, and some have been reengineered twice with more powerful motors.
New Class:	6012 6112	
No Built:	?	
Built:	1977-1984	Some 15 carriages have rebuilt with air condition to InterPici standards (Class 6112) and five vehicles (Bzmot 413-417) have been built new form bodysHELLS provided by the original manufacturers, and have different fronts.
System:	Mechanical	
Speed:	70/90	
Power:	141 / 147 kW*	
Multi:		Model: Jan Pacholýk
In Use:	259	
* Reengineered		

**6341**

Russian built 2 car DMU. 40 Ordered, 23 in service.

Class:	6342	The Siemens Desiro as used by DB and private German operators. Used on the Budapest Nyugati - Esztergom railway.
No Built:	2002	
Built:	1992	
System:	Hydro-Mechanical	Model Matthias Pichler Repaint Zsivany
Speed:	120 km/h	
Power:	550	
Multi:	Yes	
In Use:	13	



Class:	5047	5147
No Built:	2	2
Built:	1995	1996
System:	Hydraulic	
Speed:	120	120
	km/h	km/h
Power	419	419
	kW	kW
Multi:	Yes	Yes
GySEV:	2	2



Used by GySEV, the 5047 is a rail car similar to that used by the OeBB. The 5147 is a two car-set.

Model Kami Repaint Roby

Coaching Stock

Not been able to find any stock lists. However Today's Railways feels that MAV is still woefully short of quality coaching stock, particularly for non-IC Trains,

EC/IC Stock



Modern MAC EC Stock

To meet EC requirements for climatized UIC Z1 type, and not older than 15 years, MAV bought 76 200 km/h carriages from CAF of Spain (recognizable by the corrugated roof and lack of window surround) including restaurant, couchette, sleeper and

parcels wagons. These have been supplemented by wagons built by DWA in Germany.

In addition there are 200 km/h coaches built by GOSA in Yugoslavia at the end of the 80's that have been recently rebuilt for intercity work.

Regional

Non-IC long distance and stopping services use Hungarian and Polish built stock, which is in the process of being refurbished, although *Today's Railways* notes that due to lack of funds many have been withdrawn and scrapped leading to a shortage of stock



MAV By Carriages

Suburban/Short distance

Centre door stock, which can be used with a driving trailer with a V-43. The stock is being modernised



Original Bdt Driving Trailer used with V 43.



Push-pull centre stock that has been modernised. The stock has gray livery and has both the older and the UIC connections

GyseV

Use refurbished ex-MAV stock, although has recently bought ex DR Halberstadt stock that had been refurbished by DB. They can be recognised by the two sets of double doors on the carriages.

Routes



M61 NOHAB, now withdrawn. This is one of the four in the Nostalgia fleet, repainted in original color scheme on the Bakony line. Model HFL.

The first three routes that are fantasy routes.

Jászkisér – Nagybereg by Berzsenyi Máté

An East -West line between two major terminals about 40 km apart, with the line dividing into two Electrified branches, with a two transversal lines linking the two branches. The line is highly detailed, and in some ways reminds me of the French route L1 Moulinsard. Comes with one activity.

Sasvar-Szir by Jadro

An elongated V with two branches running south from Szir. The westerly branch is double tracked and electrified and the easterly branch is a single diesel line. The longer branch is about 60 km in length. There are small branch lines going off. Good detailing, although possibly less than the previous route. Does not come with activities.

Bakony by Zsivány

A diesel double track line about 60 km in length with a number of branches, including a coalmine (which you can see in the picture of the M62, large freight terminal. More mountainous (Bakony is a range of hills) and more wooded route than the others. Comes with activities.

Bp. Nyugati - Nyíregyháza

A 260 km electrified route from Budapest Nyugati station with some branches. The décor is not up to the level of the first two routes.

Signals



Hungary uses a block signal system of four lights (Green, yellow, red, yellow) to signal the speed of the train in the current, and in the next block.

See the Gigant Club site in English ‘Railroad signals on the Hungarian State Railways’

http://www2.chem.elte.hu/gigant_club/mav/signals.html

This signal shows 40km/h allowed in the current block and maximum speed in the next block..

Resources

The first three routes can be downloaded from HTSC – Hungarian Train Sim Centre <http://jadro.yofej.hu/news.php>

Europe 3 from <http://www.vm15.hu/>

Other stock can be obtained from the Virtual Modelling Works VMC <http://www.train-sim.hu/>

Details of Stock numbers and other details came from the Article in Today’s Railways in August 2004, the Gigant Club http://www2.chem.elte.hu/gigant_club/Welcome_en.html and the European Train server. <http://www.railfaneurope.net/>

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Contract me through the MSTS for Europe forum at www.uktrainsim.com

For others in the series see www.train-sim.com or <http://www.thetrain.de/>



Modernised push pull stock. The stock with the red bands has only UIC connections for use with the modernized V43.