

Scripts and icons for the Italian (RFI) signals – version 4.3 of 16/6/2011

This zip file contains all the icons and scripts needed to simulate Italian (RFI – *Rete Ferroviaria Italiana*) signals in Traindir 3¹; they work since version 3.7 of the program, but using the latest version is always recommended.

WARNING! If you still have version 3.1 or 3.0 of the package, please delete the old files before installing this package; if you copied other files (your own icons and scripts) in the package folder, remember to keep them. If you have any 4.x version of the package, all the files will be automatically updated. After installing this package you should convert all the scenarios that still use the scripts of version 3.1 or 3.0 (please see the conversion table later in this manual).

Version 4.x scripts are easier to use, as they should now take into account every possible combination of signals that come next to each other. Now you just need to choose the correct type and the number of heads (and auxiliary indicators) while in the previous version you should consider also the distance and the type of the signal coming next. For more details see the comments in each script or read on.

Now the signals support their clearing with Ctrl-click (white track, for shunting and joining trains). The train announcement and the block occupancy indicator can now work together (a new all-in-one indicator can show both the occupancy and the direction of the block); there are new ways to simulate level crossings, and now the “move in” and “move on” indicators (see the glossary) are also simulated. Some “fake” signals (as they should be hidden) can now be used to “customize” the normal aspects for particular situations.

To fully understand these instructions, please read the glossary later on, as I’m not sure about the terms used in other administrations, and some features of the Italian signals could be quite unique, thus needing specific explanations for foreign players and scenario designers.

Here is a summary of the available signals:

- Simple distant and home signals, with round heads, square heads or square heads with an arrow above. As square heads command to the left and round heads command to the right, the arrow (which is lit only when the signal is clear) helps distinguish which signal is the left one when two signals are placed on the same mast between two tracks, one commanding to the left and one commanding to the right.
- Home signals with round heads, square heads or square heads with an arrow above (as above) and a rappel (speed indication, see glossary) below. These signals are also used as exit signals for station tracks where a no stop route is allowed or the exit route is straight (see glossary).
- Exit signals with round heads, square heads or square heads with an arrow above (as above) and a triangle below. This means that any exit route from this station track has at least one diverging switch, so when the signal is not at red the driver must read the aspect as if another head was present on top, showing red. These signals cannot be used if a no stop route is allowed on the track they command.
- Permissive block signals with round heads, square heads or square heads with an arrow above (as above) and a white P below. These are usually automatic signals (to be placed along the line using the two-head icon of the editor).
- Other signals: dwarfs, level crossing signals and gates, train announcement, block occupancy, block direction and occupancy, shunting limit, dead ends, direction indicators, facing point lock status.

All main signals (i.e. all that can stop trains) now support the “Shunt” aspect for shunting: if the signal is cleared with Ctrl-click (white track), or if a speed limit lower than 30 km/h is detected before the next signal, the signal remains red, but the track turns white or green (respectively) and shunting trains can pass the signal (dwarfs, move in, move on, route continuation indicators show the correct aspect accordingly). Three head signals show the correct RYY aspect (“proceed by sight, as another train is on your track before the next signal”) to allow joining.

¹ A software by Giampiero Caprino, who designed an excellent and very versatile simulator. I must thank him for all the adjustments he did to allow the implementation of this package.

Important new features since previous versions (4.x):

Added the “shunting limit marker post” icons and script to be used inside the home signals (the previous one was actually the “start of plain line” sign, to be used outside the home signals).

The route continuation indicator is now correct²; the commanding dwarfs now support the flashing aspect, used to indicate to which track the exit signal is commanding when it can command more than one track.

Added the block direction indicator for blocks that are normally not oriented.

Added the “move in” and “move on” auxiliary signals³, that light up when the aspect of their main signal is “Shunt”. Added some special distant signals (to be placed hidden) to force some aspects when they wouldn’t normally appear (see the details in their description, later on).

Added the icons and scripts for dwarves commanding to the left.

Added the lights for the cars used in level crossings with no gates.

Installation

If you already have a version 4.x of the package, this version updates all the files automatically. If you still have version 3.1 or 3.0, delete all the files – except your own scripts and icons, if any – from the folder where you installed the previous version (typically C:\Program Files\Traindir3\Signals); if this is the first time you install a signal package, create the above suggested folder for it.

Open the .zip file, select all the files and extract them in that folder.

Open the C:\tdir3.ini file with Notepad⁴ and check that this line exists near the end of the file (the folder after the = should be the one where you extracted the package files); if this line is missing, add it at the end:

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SearchPath = C:\Program Files\Traindir3\Signals
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In this way the program will know where to look for the signals’ scripts and icons and you won’t need to include them in every scenario you create.

Description of the scripts

The script name for normal signals follows this scheme: "rfi" (the network manager company), underscore, signal type, underscore, number of heads, head shape, .tds extension. The script names for special signals follow their own scheme (see the following table). All the scripts have comments explaining how they work and how to use them; the package includes a Demo.trk scenario showing most cases. In the editor almost all the scripts are to be assigned to signals that were placed in the scenario using the single head icon. The only exception are automatic signals, i.e. permissive block signals.

Normal signals

rfi_avv_*.tds	Pure distant signals (see glossary) with 1 or 2 heads: round (N), square (Q) or square with an arrow above (F). They cannot stop trains and thus cannot show the “Stop” (red) aspect (all aspects have ‘none’ as action). They must be followed by a main signal (normal or special); following distant signals are ignored, as according to the Italian rules only one pure distant can exist between two main signals.
rfi_prot_*.tds rfi_prot_*R*.tds	Home signal (used also as exit signal when a no stop route is allowed or one exit route is straight) with 1, 2 or 3 heads: round (N), square (Q) or square with an arrow above (F); also with a rappel (R between the number and the shape of the heads – see the glossary). They can stop trains and can be followed by whatever signal (normal or special).

² Thanks to Luca Mazzucco for reporting the bug and explaining the correct use and meaning of this aspect.

³ Thanks to Marco (etr300) for suggesting the way of working that I decided to implement.

⁴ Windows 7 and Vista users must launch Traindir (and Notepad) with administrative rights so it can create the file and save your preferences.

<code>rfi_part_**.tds</code>	Exit signals (used when a no stop route is not allowed and every exit route has at least one diverging switch), with 1 or 2 heads: round (N), square (Q) or square with an arrow above (F) and a triangle below. They can stop trains and can be followed by whatever signal (normal or special). If the home signal has 3 heads, or if the route to these signals is straight, you should put the special hidden distant <code>rfi_avv_part.tds</code> before them, so the home signal will consider them red even when they aren't (the program cannot force the player to clear either the home or the exit and not both, as it would be in the real world, so the home will at least "see" always a red, as it should).
<code>rfi_perm_**.tds</code>	Permissive signals (white P under the heads), with 1 or 2 heads: round (N), square (Q) or square with an arrow on top (F). They can stop trains and can be followed by whatever signal (normal or special). As usually these signals turn automatically back to the most clear aspect as soon as possible, they should be placed in the scenario using the 2 head icon of the editor. All the automatic signals must be "activated" at the beginning of the simulation with the "Set sig. to green" menu command.

Departure repeater

<code>rfi_ind_part.tds</code>	Departure indicator, to be used as a distant of the exit signal when the latter is far from the platform (warning: there cannot be any switch between this signal and the linked exit signal). The indicator is lit when the exit signal is not red (i.e. neither at "Stop" nor at "Shunt").
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Special signals to be placed before and adjacent to a main signal.

<code>rfi_avanz.tds</code> <code>rfi_avvio.tds</code>	"Move in" and "Move on" indicators, mounted under the heads of a home or exit signal (respectively) to indicate that the train can respectively enter or leave the station even if the signal cannot be set to a clear aspect. In Traindir they are distant, working as shunting indicators: they light up (in white and light blue respectively) when the main signal is clear for shunting (i.e. red but passable). If the main signal features also the direction indicator (<code>rfi_ind_dir.tds</code>), the latter should be placed in the middle.
<code>rfi_ind_dir.tds</code>	Direction indicator, actually a distant to be placed adjacent to a main signal. To activate the indicator, put a fake station in each branch after the main signal, named after the number ⁵ you want to appear when the main signal is clear towards that branch ('zero' for 0, 'one' for 1, and so on). If no such stations are found in the route after the main signal, the indicator will stay off. The indicator can show also the letters A, D, P, ^ (these are lit also when the signal is red) to be combined with the home and the exit signal of the straight route track of a station when the station is disabled and unmanned (insert a fake station named A, D, P, V respectively). See the glossary for details.

Dwarfs

<code>rfi_marm_i.tds</code>	Commanding dwarf: it's actually a main signal, as it stops trains when not clear, and the previous signal considers its aspect correctly. It's normally used in yards to control shunting movements. If you put a fake station named X between this and the next signal (typically an exit one), you can get the flashing clear aspect, used to indicate that the common exit signal that follows is clear for this track.
<code>rfi_marm_a.tds</code>	Irrelevant repeater dwarf, a distant that's just a repeater of the main signal that follows. The dwarf is clear whenever the main doesn't show "Stop" (so also when it shows "Shunt").
<code>rfi_marm_m.tds</code>	Irrelevant shunting dwarf, a distant that is clear only when the main signal that follows shows "Shunt".
<code>rfi_marm_*d.tds</code>	Same as above, but commanding the track to the left of the signal.

⁵ Counting the branches from left to right; 0 is used for "dead" or special branches like yards, depots, etc.

Special signals, to be used as hidden distant

rfi_avv_dev.tds	Force diverging aspects: put this signal after a main signal if you want it to show diverging aspects even if all the switches along the route are straight. This distant is to be placed before the first switch after the main signal, and is compatible with the next two special distant. It is used in bigger stations, to slow down also the straight route track without needing to slow down the line speed.
rfi_avv_part.tds	Block pass-through aspects: place this signal before an exit signal and the home will show “Prepare to stop” even if the exit signal is already clear ⁶ . It should be used when the home has 3 heads or when the route to the exit signal is straight, or when the exit is common to more tracks (the commanding dwarf is also needed). It’s compatible with the “force diverging aspects” distant.
rfi_avv_tronc.tds	Very short block: place this distant after a main signal to force it at YY or RYY (“Prepare to stop at next signal, which is nearer than 600 m”) even when the distance to the next signal (or track end) is more than 600 m. Other aspects still consider the actual distance. It’s typically used in head stations, to indicate that the train will be received in the shorter set of tracks, even if the tracks are actually longer than 600 m. It’s compatible with the “force diverging aspects” distant.

Shunting limit

rfi_LM.tds rfi_LM_s.tds rfi_LM_d.tds	This signal looks like and simulate the post or the sign (to the left or to the right of the track) – to be used respectively inside or outside the home signals – that shunting trains cannot pass when moving towards the plain line. This is actually a main signal that stops trains. As it cannot be limited to shunting trains, it can be cleared as any other signal (but its aspect doesn’t change), so normal trains can pass it. For the previous signal it’s a red, so if you want to mask it (i.e. see a clear instead of a “Prepare to stop” aspect) you must place a hidden level crossing distant (rfi_avv_PL.tds) before it.
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Train announcement (indicating that a train will soon appear in the visible part of the scenario)

rfi_AT_a.tds	Special automatic signal (use the <u>two head</u> icon of the editor to place it) to be linked at the beginning of an auxiliary hidden track that precedes the visible entry point. The length of the hidden track determines how long the player will see the indicator lit before the train becomes visible. The indicator lights up as soon as the train passes the signal and remains lit until the train passes the first signal after the visible entry point. If the first signal is very far from the entry point, consider placing a hidden automatic signal just after the visible entry point, to turn off the announcement as soon as the train becomes visible. This indicator works only for unidirectional tracks where trains enter the scenario, so it’s suitable only for two track lines, where all trains enter from one track and exit from the other.
rfi_AT_i.tds	Special main signal to be placed immediately after the visible entry point and to be “cleared” by a pedal placed at the beginning of an auxiliary hidden track that precedes the visible entry point. The indicator goes off when the train passes it. The length of the hidden track determines how long the player will see the indicator lit before the train becomes visible. This signal is compatible with the block occupancy indicator for bidirectional tracks (rfi_ob_bi.tds), so it’s the only one suitable for single track lines, where trains enter and exit the scenario from the same track.
rfi_AT_small_i.tds rfi_AT_small_a.tds	Small version of the previous indicators.

⁶ In Italy an exit signal with the triangle can be cleared only if a train is occupying the track circuit before it. This enforces the fact that exit and home cannot be open simultaneously (as a no stop route is not allowed when the triangle exit signals are used). This cannot be enforced in Traindir, but at least the home will show the correct aspect even if the exit is already open.

Block occupancy (indicates that a train is still occupying the block just after a visible exit point)

rfi_OB_auto.tds	<p>Special automatic signal (use the <u>two head</u> icon of the editor to place it) to be linked at the beginning of an auxiliary hidden track that follows the visible exit point. The indicator lights up when the train passes the signal, and goes off when the train actually leaves the scenario from the hidden track. When the indicator is lit the previous block signal will show “Prepare to stop”, otherwise it will show “Clear”.</p> <p>This indicator works only for unidirectional tracks where trains leave the scenario, so it’s suitable only for two track lines, where all trains enter from one track and exit from the other.</p>
rfi_OB_bi.tds	<p>Special distant to be placed before an auxiliary hidden signal, the latter being at the end of an auxiliary hidden track that follows the visible exit point. The indicator lights up when the auxiliary is clear (to clear it, use a pedal placed just before the visible exit point), and goes off when the train passes the auxiliary signal. When the indicator is lit the previous block signal will show “Prepare to stop”, otherwise it will show “Clear”. This signal is compatible with the Train Announcement indicator for bidirectional tracks (rfi_AT_i.tds), so it’s the only one suitable for single track lines, where trains enter and exit the scenario from the same track.</p>

Block direction and occupancy

rfi_DB_avv.tds	<p>Block direction and occupancy indicator, for bidirectional tracks.</p> <p>It should be linked as distant of an auxiliary signal followed by a switch, on a hidden track placed before/after the visible entry/exit point.</p> <p>The block is oriented in the same direction as the signal having this script if the switch after the auxiliary signal is diverging; the block is oriented in the other direction if the switch is straight. The block is occupied (in the current direction) when the auxiliary signal is cleared. At the beginning of the simulation the block is free and oriented in the direction opposite to the signal having the script.</p> <p>The Demo_blocco.trk demo scenario shows a particular auxiliary track which allows the entry and exit of trains with the correct indications (including the “Prepare to stop” aspect on the last visible signal when the block is occupied in the exit direction). This particular track is available as a macro (to be placed with the “Macro” and “Place” buttons of the editor) for each of the 4 possible exit directions: Blocco_dx.trk (east), Blocco_sx.trk (west), Blocco_giu.trk (south), Blocco_su.trk (north).</p>
rfi_DB_s.tds	<p>Simple block direction indicator (doesn’t show the occupancy), to be linked to an isolated hidden track element. This signal must be “cleared” and “uncleared” through pedals, so mark the “No penalty for un-necessary clicks” option.</p>
tln_DB_s.tds	<p>Direction and Occupancy indicators for blocks that are normally not oriented (used by another Italian company, “LeNord”). Place a signal for each direction, both linked to an isolated hidden track. The script that follows lights up the correct indicator: just customize the coordinates in the script and associate it to the track element in the center of the block. In the example this center element is at 5,5, while 4,5 is the element to the left; 4,3 and 6,3 are the two indicators for the left and right direction respectively. To switch off the indicators, use a pedal placed at the end of the block, so mark the “No penalty for un-necessary clicks” option.</p>
<pre>OnSetBusy: # When this track element turns to green... if Track(4,5).color = black # ...if the element to the left is still black... if Signal(4,3).aspect = red do click 4,3 # ...the block is to be oriented to the left... end else # ...otherwise to the right. if Signal(6,3).aspect = red do click 6,3 end end # NOTE: Use Notepad to customize the script and end # remove all comments before assigning it to the track</pre>	

Level crossing (with gates) signals

rfi_avv_PL.tds rfi_prot_PL_i.tds	<p>These signals (distant and home respectively) are specific for protecting level crossings, when the nearest normal signal would be too far, (typically in single track lines, where the section between the exit signal of a station and the home signal of the next is a single block section with no other signals). In this case the gates position is not simulated and the level crossing home – which is actually a main signal that stops trains – has to be cleared in advance using a pedal or an itinerary. See the glossary for details.</p> <p>The previous normal signal ignores these specific signals and always clears at green, but if these signals are nearer than usual you can have the previous signal show a flashing yellow by using <code>rfi_avv_PL_i.tds</code> instead of <code>rfi_avv_PL.tds</code></p>
rfi_avv_PL.tds rfi_prot_PL_a.tds rfi_PL_i.tds	<p>These signals (distant, home and gates) are specific for protecting level crossings, in the case when also the gates position is simulated. In this case the gates are the main signal that stops the trains, while the other two are distant.</p> <p>When using these three signals in both directions the gates cannot be closed together, which is unrealistic. If you want to see both gates closed, and the signals at clear for both directions (as it happens in the real world) a trick must be used: place two sequences of these signals (using <code>rfi_PL_i.tds</code> in the first and <code>rfi_PL_a.tds</code> in the second) linked to an isolated hidden track having a U shape. Place one sequence on each “arm” of the U, in such a way that all signals are distant of the first gate (<code>rfi_PL_i.tds</code>): clicking on this gate should clear all of them. This gate signal will be cleared and uncleared by pedals (remember to mark the “No penalty for unnecessary clicks” option), as the train passes elsewhere. Two macro blocks containing the auxiliary tracks and the signals are included in the package (<code>PL_oriz.trk</code> and <code>PL_vert.tds</code>, with horizontal and vertical tracks respectively). Place the suitable one somewhere in the scenario using the “Macro” and “Place” buttons and then move the signals near the real tracks.</p> <p>This is the most realistic simulation of level crossings, but the home signal will not stop trains when the gates are closed⁷. If you want also this to happen, add a hidden sequence of distant and home (as in the case when the gates are not simulated) and clear also this home with the pedals.</p> <p>As in the real world, the previous normal signal ignores these specific signals and always clears at green.</p>
rfi_avv_PL_big.tds rfi_prot_PL_big_a.tds rfi_prot_PL_big_i.tds	Bigger version of the previously described signals.
rfi_PL_a.tds	Special distant repeating the gates position indicator (<code>rfi_PL_i.tds</code>) in a level crossing. See the three signals sequence above.
rfi_avv_PL_i.tds	This version of the level crossing distant forces the previous normal signal to take into account the distance between level crossing distant and home (if this distance is less than usual the normal signal will show a flashing yellow instead of a green).

Level crossing (no gates) signals

rfi_prot_PL_s.tds	Special signal to protect level crossings with no gates for the cars (just 2 flashing red lights). When lit it indicates that the lights for the cars are also lit. In Traindir it's a main signal that stops trains when “off”, so it must be “cleared” in advance using a pedal. For the previous signal it's a red, so if you want to mask it (i.e. see a “Clear” instead of a “Prepare to stop” aspect) you must place a hidden level crossing distant (<code>rfi_avv_PL.tds</code>) before it.
rfi_prot_PL_b.tds	Special signal simulating the red lights for the cars in a level crossing with no gates, to be placed as a distant of the signal for the trains (<code>rfi_prot_PL_s.tds</code>)

⁷ As in the real world: see the glossary for the driver's expected behaviour.

Facing point lock status

rfi_TD.tds	Special signal to be linked to an isolated hidden track element, to be “cleared” and “uncleared” through pedals, so mark the “No penalty for un-necessary clicks” option. This signal has no effect on trains (actually they don’t see it: it’s only on the CTC panel) and shows the facing point lock (FPL) status. When FPL is active, the points are locked in such a strong way that a trailing point movement would force the train to derail (otherwise it would just break the switch mechanism and throw the points in the needed position). FPL is required active for every facing point movement, except when elastic switches are used (only at very low speed). In these switches simple springs keep the points in the straight position (the only one allowing facing point movement, at very low speed) but allow trailing point movements also from the diverging track.
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Ringbell

rfi_leopolder.tds	<p>This is a distant to be hidden before a home signal or before the train announcement rfi_AT_i.tds. When the signal that follows is cleared, a sound is played. The sound file (leopolder.wav) must be distributed with every scenario that uses this script, as the program doesn’t look for it in the signals’ folder.</p> <p>In the real world this bell rings until the home signal is uncleared, warning all the people in the station that the home is open for a train to arrive, so no shunting can occur and no manual switches can be thrown. When the ring stops the train has passed the home signal, so it’s very near: all people are warned to stop crossing any track until the train has stopped or passed by. Nowadays this bell is obsolete and is being dismantled, as most switches are remotely operated and voice announcements keep warning all passengers that crossing the tracks is always prohibited.</p>
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Dead end

rfi_tronc.tds	This always red signal (mark the specific option in the properties) looks like a dead end. It should be linked to the last track element to block the trains, that would otherwise exit the scenario. Previous signals will show the correct aspect (“Prepare to stop”).
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All the signals (not only permissive ones) can be automatic, so they will turn automatically back to the most clear aspect as soon as possible: just place them in the scenario using the two head icon of the editor and then associate the chosen script. At the beginning of the simulation the “Set sig. to green” menu command activates this feature and clears all of them.

This feature can be temporarily disabled by right-clicking such a signal when clear (so it will remain red after the next train passes it), or by explicitly unclearing it. This feature can later be activated again by clearing and then right-clicking the signal.

Unfortunately, there is no way to know if a scripted signal is automatic and if the feature is active at the moment, except when issuing the “Set sig. to green” menu command at the beginning of the simulation.

Icon naming

This is the naming convention for icons: two uppercase letters telling the icon type, underscore, lowercase letters describing the aspect (colour sequence, position, size, etc.), underscore, one uppercase letter indicating the direction, .xpm extension.

Types

AT:	Train Announcement
OB:	Block Occupancy
DB	Block Direction (and occupancy)
ID:	Direction Indicator (from 0 to 9) or the letters P, A, D, ^ for unmanned stations
TD:	Facing Point Lock indicator
PL:	Level Crossing gates position, sign or lights for LCs without gates
LQ, LT:	Special signals for protecting level crossings, with square or triangular head
LM:	Post or sign indicating the shunting limit or the beginning of the plain line
MA, MF:	Dwarf (lower signal used for shunting), commanding to the right or to the left
TR:	Dead End, special fake signal to prevent trains from exiting the scenario
PN, PQ, PF:	Permissive signals (white P under the heads) with round heads, square heads or square heads with an arrow above.
NN, NQ, NF:	Normal signals, with round heads, square heads or square heads with an arrow above.
RN, RQ, RF:	Signals with a rappel (speed indication) under the heads, with round heads, square heads or square heads with an arrow above.
TN, TQ, TF:	Exit signals (white a triangle below the heads) with round heads, square heads or square heads with an arrow above.
AV	“Move in” or “Move on” signal (see glossary)

Aspects

b,r,y,g:	Colours: black (off), red, yellow, green – one letter per head starting from the top.
–, =, +:	After the colours, indicates the rappel (one or two lines), or the arrow, or just the P.
on, off, b,r,w,c:	On, off or colours for auxiliary signals: black (off), red, white, cyan
l, –, _:	Gate position (open, closed) or dwarf aspect: vertical line, horizontal line, off.
big, small:	Size (for level crossing or train announcement signals).
off, 0,1,..., 9, P,A,D,V	Off, numbers, letters, for the direction indicator.

Directions

N,S,W,E,X:	Icon is oriented for trains going up, down, to the left, to the right, or in any direction.
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Conversion of old scenarios using 3.1 or 3.0 scripts

The following table lists the scripts that need to be replaced; other scripts have been updated keeping the same name, so no action is needed.

Suggested method⁸: open the scenario in Traindir, and at the same time open its .trk file with Notepad. In Traindir hover the mouse on every signal that shows the standard icon instead of the desired one, take note of which script it's using, switch to Notepad and do a global search & replace of that script with the new one (taken from the table below). Save the .trk without closing it and reload the scenario in Traindir: all the signals using the replaced script should now be OK; repeat the procedure until all signals are OK. One head signals can be ambiguous when unclear (the red icon is the same), so clearing is needed to verify them, as the clear aspects icons of the scripts are always different from the standard green one.

Replace this	with this	Replace this	with this	Replace this	with this
rfi_avv1F_i.tds	rfi_avv_1F.tds	rfi_prot2F_ii.tds	rfi_prot_2F.tds	rfi_prot2RF_ii.tds	rfi_prot_2RF.tds
rfi_avv1N_i.tds	rfi_avv_1N.tds	rfi_prot2F_in.tds		rfi_prot2RF_in.tds	
rfi_avv1Q_i.tds	rfi_avv_1Q.tds	rfi_prot2F_ip.tds		rfi_prot2RF_ip.tds	
rfi_avv2F_i.tds	rfi_avv_2F.tds	rfi_prot2F_ir.tds		rfi_prot2RF_ir.tds	
rfi_avv2F_r.tds		rfi_prot2F_ni.tds		rfi_prot2RF_ni.tds	
rfi_avv2N_i.tds	rfi_avv_2N.tds	rfi_prot2F_nn.tds		rfi_prot2RF_nn.tds	
rfi_avv2N_r.tds		rfi_prot2F_np.tds		rfi_prot2RF_np.tds	
rfi_avv2Q_i.tds	rfi_avv_2Q.tds	rfi_prot2F_nr.tds		rfi_prot2RF_nr.tds	
rfi_avv2Q_r.tds		rfi_prot2F_pi.tds		rfi_prot2RF_pi.tds	
rfi_part1F_i.tds	rfi_part_1F.tds	rfi_prot2F_pn.tds		rfi_prot2RF_pn.tds	
rfi_part1F_in.tds		rfi_prot2F_pp.tds		rfi_prot2RF_pp.tds	
rfi_part1F_ip.tds		rfi_prot2F_pr.tds		rfi_prot2RF_pr.tds	
rfi_part1F_n.tds		rfi_prot2F_ri.tds		rfi_prot2RF_ri.tds	
rfi_part1F_ni.tds		rfi_prot2F_rn.tds		rfi_prot2RF_rn.tds	
rfi_part1F_p.tds		rfi_prot2F_rp.tds		rfi_prot2RF_rp.tds	
rfi_part1F_pi.tds		rfi_prot2F_rr.tds		rfi_prot2RF_rr.tds	
rfi_part1N_i.tds	rfi_part_1N.tds	rfi_prot2N_ii.tds	rfi_prot_2N.tds	rfi_prot2RN_ii.tds	rfi_prot_2RN.tds
rfi_part1N_in.tds		rfi_prot2N_in.tds		rfi_prot2RN_in.tds	
rfi_part1N_ip.tds		rfi_prot2N_ip.tds		rfi_prot2RN_ip.tds	
rfi_part1N_n.tds		rfi_prot2N_ir.tds		rfi_prot2RN_ir.tds	
rfi_part1N_ni.tds		rfi_prot2N_ni.tds		rfi_prot2RN_ni.tds	
rfi_part1N_p.tds		rfi_prot2N_nn.tds		rfi_prot2RN_nn.tds	
rfi_part1N_pi.tds		rfi_prot2N_np.tds		rfi_prot2RN_np.tds	
rfi_part1Q_i.tds	rfi_part_1Q.tds	rfi_prot2N_nr.tds		rfi_prot2RN_nr.tds	
rfi_part1Q_in.tds		rfi_prot2N_pi.tds		rfi_prot2RN_pi.tds	
rfi_part1Q_ip.tds		rfi_prot2N_pn.tds		rfi_prot2RN_pn.tds	
rfi_part1Q_n.tds		rfi_prot2N_pp.tds		rfi_prot2RN_pp.tds	
rfi_part1Q_ni.tds		rfi_prot2N_pr.tds		rfi_prot2RN_pr.tds	
rfi_part1Q_p.tds		rfi_prot2N_ri.tds		rfi_prot2RN_ri.tds	
rfi_part1Q_pi.tds		rfi_prot2N_rn.tds		rfi_prot2RN_rn.tds	
rfi_part2F_i.tds	rfi_part_2F.tds	rfi_prot2N_rp.tds		rfi_prot2RN_rp.tds	
rfi_part2N_i.tds	rfi_part_2N.tds	rfi_prot2N_rr.tds		rfi_prot2RN_rr.tds	
rfi_part2Q_i.tds	rfi_part_2Q.tds	rfi_PL.tds	rfi_PL_i.tds	rfi_OB_avv.tds	rfi_OB_auto.tds ⁹

⁸ If your system features an advanced editor like Notepad++, supporting regular expressions (regex), you can just globally replace the string `([1-3]R*[NFQ])_.+\.tds` with the string `_1.tds`

⁹ You need also to replace the signal at the beginning of the hidden track with an automatic one (two head icon of the editor), then assign the new script to the new signal (in Traindir).

Replace this	with this	Replace this	with this	Replace this	with this
rfi_perm1F_i.tds rfi_perm1F_n.tds rfi_perm1F_p.tds rfi_perm1F_r.tds	rfi_perm_1F.tds	rfi_prot2Q_ii.tds rfi_prot2Q_in.tds rfi_prot2Q_ip.tds rfi_prot2Q_ir.tds	rfi_prot_2Q.tds	rfi_prot2RQ_ii.tds rfi_prot2RQ_in.tds rfi_prot2RQ_ip.tds rfi_prot2RQ_ir.tds	rfi_prot_2RQ.tds
rfi_perm1N_i.tds rfi_perm1N_n.tds rfi_perm1N_p.tds rfi_perm1N_r.tds	rfi_perm_1N.tds	rfi_prot2Q_ni.tds rfi_prot2Q_nn.tds rfi_prot2Q_np.tds rfi_prot2Q_nr.tds		rfi_prot2RQ_ni.tds rfi_prot2RQ_nn.tds rfi_prot2RQ_np.tds rfi_prot2RQ_nr.tds	
rfi_perm1Q_i.tds rfi_perm1Q_n.tds rfi_perm1Q_p.tds rfi_perm1Q_r.tds	rfi_perm_1Q.tds	rfi_prot2Q_pi.tds rfi_prot2Q_pn.tds rfi_prot2Q_pp.tds rfi_prot2Q_pr.tds		rfi_prot2RQ_pi.tds rfi_prot2RQ_pn.tds rfi_prot2RQ_pp.tds rfi_prot2RQ_pr.tds	
rfi_perm2F_i.tds rfi_perm2N_i.tds rfi_perm2Q_i.tds	rfi_perm_2F.tds rfi_perm_2N.tds rfi_perm_2Q.tds	rfi_prot2Q_ri.tds rfi_prot2Q_rn.tds rfi_prot2Q_rp.tds rfi_prot2Q_rr.tds		rfi_prot2RQ_ri.tds rfi_prot2RQ_rn.tds rfi_prot2RQ_rp.tds rfi_prot2RQ_rr.tds	
rfi_prot1F_i.tds rfi_prot1F_n.tds rfi_prot1F_p.tds rfi_prot1F_r.tds	rfi_prot_1F.tds	rfi_prot3F_i.tds rfi_prot3F_n.tds rfi_prot3F_p.tds rfi_prot3F_r.tds	rfi_prot_3F.tds	rfi_prot3RF_i.tds rfi_prot3RF_n.tds rfi_prot3RF_p.tds rfi_prot3RF_r.tds	rfi_prot_3RF.tds
rfi_prot1N_i.tds rfi_prot1N_n.tds rfi_prot1N_p.tds rfi_prot1N_r.tds	rfi_prot_1N.tds	rfi_prot3N_i.tds rfi_prot3N_n.tds rfi_prot3N_p.tds rfi_prot3N_r.tds	rfi_prot_3N.tds	rfi_prot3RN_i.tds rfi_prot3RN_n.tds rfi_prot3RN_p.tds rfi_prot3RN_r.tds	rfi_prot_3RN.tds
rfi_prot1Q_i.tds rfi_prot1Q_n.tds rfi_prot1Q_p.tds rfi_prot1Q_r.tds	rfi_prot_1Q.tds	rfi_prot3Q_i.tds rfi_prot3Q_n.tds rfi_prot3Q_p.tds rfi_prot3Q_r.tds	rfi_prot_3Q.tds	rfi_prot3RQ_i.tds rfi_prot3RQ_n.tds rfi_prot3RQ_p.tds rfi_prot3RQ_r.tds	rfi_prot_3RQ.tds

For script designers: rules to consider in normal signals when placed before special signals

Signal	Type	Aspects	Rules for preceding normal signals
rfi_AT_a	automatic	red, off	Irrelevant, as it's always the first signal
rfi_AT_i	main	red, on	Irrelevant, as it's always the first signal
<i>rfi_ind_dir</i>	<i>distant</i>	<i>off, 0-9, a, p, d, v</i>	<i>To be ignored: consider the next one</i>
rfi_LM*	main	red, green	Always seen as a "red", so it needs to be masked
<i>rfi_marm_a</i>	<i>distant</i>	<i>red, shunt</i>	<i>To be ignored: consider the next one</i>
<i>rfi_marm_m</i>	<i>distant</i>	<i>red, shunt</i>	<i>To be ignored: consider the next one</i>
rfi_marm_i	main	red, shunt, flashing	Already considered (same aspect as a normal)
rfi_OB_auto	automatic	red, green	Already considered (same aspect as a normal)
<i>rfi_OB_bi</i>	<i>distant</i>	<i>red, green</i>	<i>To be intercepted as special case: a red distant</i>
<i>rfi_DB_avv</i>	<i>distant</i>	<i>red, white, anti_red, anti_white</i>	<i>To be intercepted as special case: a red distant</i>
rfi_DB_s	main	red, white	Irrelevant, as it's linked to an isolated track
tln_DB_s	main	red, on	Irrelevant, as it's linked to an isolated track
rfi_PL_i	main	red, closed	Should be always preceded by specific distants
<i>rfi_PL_a</i>	<i>distant</i>	<i>clear, closed</i>	<i>Should be always preceded by specific distants</i>
rfi_prot_PL_s	main	red, closed	Always seen as a "red", so it needs to be masked
rfi_prot_PL_i	main	red, closed	Should be always preceded by specific distants
<i>rfi_prot_PL_a</i>	<i>distant</i>	<i>clear, closed</i>	<i>Should be always preceded by specific distants</i>
<i>rfi_avv_PL</i>	<i>distant</i>	<i>yellow_flashing, green</i>	<i>To be intercepted as a normal distant</i>
<i>rfi_avv_PL_i</i>	<i>distant</i>	<i>yellow_yellow, yellow, green</i>	<i>To be intercepted as a normal distant</i>
rfi_tronc	main	red	Already considered (same aspect as a normal)
rfi_TD	main	red, on	Irrelevant, as it's linked to an isolated track
<i>rfi_avv_part</i>	<i>distant</i>	<i>red</i>	<i>To be intercepted as a special case: a red distant</i>
<i>rfi_avv_tronc</i>	<i>distant</i>	<i>short</i>	<i>To be intercepted as a special case.</i>
<i>rfi_avv_dev</i>	<i>distant</i>	<i>thrown, yellow_thrown, flashing_thrown, green_thrown, short_thrown</i>	<i>To be intercepted as a special case.</i>
<i>rfi_ind_part</i>	<i>distant</i>	<i>red, on</i>	<i>To be ignored: consider the next one</i>
<i>rfi_leopolder</i>	<i>distant</i>	<i>red, sound</i>	<i>To be ignored: consider the next one</i>

GLOSSARY – The Italian equivalent is in *italic*

Main signal (*segnale imperativo*)

A signal that can show the “Stop”¹⁰ aspect, and thus can stop trains. In Traindir it can have the “red” aspect, the only one that can have “stop” as action. Most of the signals are of this type.

Pure / Combined main signal (*segnale imperativo puro / segnale con avviso accoppiato*)

Pure main signals don't tell anything about the next signal aspect (they can show only “Stop”, “Clear” or “Diverging clear”- R, G or RG). Nowadays the main lines feature concatenated block signalling, so most of the signals are “combined”, i.e. they act also as distant of the next, showing many more aspects. The only pure main signals remaining are exit signals protecting single track lines or home signals protecting single track junctions. Pure main signals must be followed by pure distants, which have a different mast colouring, so main signals are qualified as pure or combined only when necessary, as this property is always evident from the line layout.

Permissive signal (*segnale permissivo*)

A particular main signal that in the real world can be passed even when at “Stop” (usually after stopping and waiting for some time, but without being told by someone else). Signals that are always permissive feature a white sign with a black P on the mast, while a white P may light up under the heads of other signals when they are permissive only at times.

Distant signal (*segnale di avviso*)

A signal that can tell something about the next signal aspect. All main signals that can show restrictive aspects (requiring a stop or a speed reduction) must be preceded by a distant warning about those aspects in advance. Nowadays most of these distants are combined with the preceding main signal (see also Pure / Combined main signal), but pure distants still exist, usually on single track lines.

Pure distant (*segnale di avviso puro*)

This signal cannot stop trains, so it cannot show the “Stop” aspect, but always gives some information about the next signal aspect. In Traindir this signal has no effect on trains and blocks, as all of its aspects have “none” as action, so many special and “fake” signals are of this type. In the real world the mast of these signals and the signs announcing them are coloured in a unique way, so the drivers know that even if unlit (faulty) they don't require an emergency stop.

Normal signals (*segnali normali*)

Signals that represent and simulate real world signals.

Special signals (*segnali speciali*)

Signals used only in Traindir to simulate other objects (Level crossings, Dead ends) or particular situations.

Auxiliary signals (*segnali ausiliari*)

Signals that represent and simulate indicators, signs, etc. that in the real world are combined in a single signal but in Traindir need a separate “signal” object.

Home signal (*segnale di protezione*)

The signal that protects a station, a junction or a level crossing. Bigger stations can have more than one such signal along the entering route (each one acting also as the distant of the next).

¹⁰ Real aspects names have a capital letter, Traindir aspects names are all lowercase, both are quoted.

Exit signal (*segnale di partenza*)

The signal that protects the line and allows a train to leave a station. Bigger stations can have more than one such signal along the exiting route (each one acting also as the distant of the next).

Block signal (*segnale di blocco*)

Intermediate signal that protects just a line section. It's usually permissive (P under the heads), completely automatic and concatenated with the next, i.e. each such signal acts also as distant of the next.

Straight route (*corretto tracciato*)

The route in a station/junction that is usually the continuation of the plain/main line and so has no switches in the diverging position. In disabled unmanned stations (e.g. by night) this route is permanently locked in the switches, so the home and exit signals can become permissive (a P is lit under their heads) and clear themselves automatically as soon as possible. Normal signal aspects tell the driver that his train will travel this route. Actually, any route that doesn't require a speed lower than the line speed is "straight".

Diverging route (*tracciato deviato*)

Any route that has at least one switch in the diverging position, thus requiring a speed reduction (to 30, 60 or 100 km/h, depending on the diverging track radius and on the line speed) and specific signal aspects¹¹.

Normal (signal) aspects (*aspetti normali*)

All clear aspects where the topmost head is not red and no triangle is present under the heads. No speed reduction is specifically enforced (preparing to stop or to reduce speed by the next signal is left to the driver), as the train will follow the straight route (see above).

Diverging (signal) aspects (*aspetti in deviata*)

All clear aspects where the topmost head is red or a triangle is present under the heads (the rest of the aspect is and means the same as a normal aspect). They indicate that the train will follow a diverging route requiring a speed reduction (to which speed is told by the distant, and eventually "reminded" by the rappel that is mounted under the heads). If no rappel is present, if the distant didn't give any speed indication (the next signal being not clear yet), a reduction to 30 km/h is implied. In exit signals from which only diverging routes are possible, a white triangle under the heads tells the enforced speed (30 km/h if empty, 60 km/h if "60" is written in it) and the topmost head at red must be imagined by the driver when the signal is clear, thus saving the installation of a head that would always be red.

Rappel (*rappel*)

A speed reminding indicator placed under the lower head of a main signal that can show diverging aspects, to be considered only when such an aspect is shown: two horizontal white lines mean reduction to 100 km/h, one horizontal white line means reduction to 60 km/h, rappel off means reduction to 30 km/h, no rappel means reduction to 30 km/h unless the distant indicated another speed.

¹¹ In curved or Y switches, both branches can be "straight" or "diverging", depending on the possibility of travelling at line speed or not. For the signal aspects, "diverging" means actually "requiring to slow down to a speed lower than line speed": if the line speed is already lower than or equal to the speed required by the switch geometry for the diverging route, normal aspects are used also for that route, and only the direction indicator will tell the driver the route he'll travel.

Dwarf / Shunting signal (*marmotta / segnale di manovra*)

Signals placed at ground level to be considered (usually) only by shunting trains. They usually command only short movements (over a couple of switches or so), and don't tell anything about the next signal, as the latter should be already visible. The first of them is usually mounted at the base of a normal signal (the home or the exit), forming a single signal that can show "Shunt" (red with dwarf showing "Clear"). If the normal signal is clear, all shunting signals are overridden until the next normal signal, so they can show either "Clear" (typically in bigger stations, to help the driver "see" the route he will travel) or remain at "Stop" and just be ignored. The flashing aspect of a dwarf isn't actually a shunting aspect, and is used before an exit signal to indicate the track to which the latter is commanding, when the exit signal is common to more than one track.

"Move in" / "Move on" indicators (*segnale di avanzamento / segnale di avvio*)

These indicators (two horizontal lights) are placed under the heads of a home (white lights) or an exit signal (cyan lights) respectively. These lights are manually lit by the CTC operator when the signal cannot be cleared (for example due to a faulty switch position detector), but the operator has checked that the line is clear, so the signal can be passed at shunting speed even if red. If the lights flash (together), the driver must proceed very slowly, as he/she has to check the switch positions for the expected route¹². In traindir only the fixed lit aspect is simulated, and it appears when the signal is open with ctrl-click for shunting.

Shunting limits (*limiti delle manovre*)

Normally shunting movements in stations must always be protected by the home signals, so shunting trains moving towards the line should never get nearer than a braking distance (for a train coming from the line) from the home signal. This point is usually marked by a concrete post coloured with white and black horizontal stripes.

When the line features concatenated block signalling, the last automatic signal before the home signal can detect any train that passes the latter towards the line, and protect it by turning immediately red. So if no other trains have already passed this last signal, shunting movements can proceed towards the line until all the shunting train is just beyond the home signal (the last block signal is always further than braking distance for an arriving train). This simplifies shunting, as the next movement (typically back towards the station) can be controlled through the home signal itself, with normal aspects, so just one dwarf per track in the exit direction is the minimum installation required to control all shunting. In this case the maximum length allowed beyond the home signal towards the line is marked by a special sign (magenta triangle in a white square) that means "beginning of the plain line" (*inizio della piena linea*). Both markers are simulated in Traindir.

Level crossings (*passaggi a livello*)

Level crossings are protected by normal signals when these are near enough: the interlocking just prevents the signal from opening if the gates aren't closed, and the request to clear the signal triggers the gates closure (the signal then clears when the closed position is detected). Should the closed position detection go off, the signal would turn back to "Stop" immediately and automatically. In some larger crossings a button near the gates can be pushed to obtain this, in case a car is stuck on the tracks when the gates close.

If normal signals are too far, on one or both sides, they will ignore the gates position, and specific signals will be installed to protect the level crossing: a home with a square head and a distant with a triangular head. Both feature a specific light geometry: three horizontal lights for "Caution: gates open" (yellow for the distant, red for the home), and two vertical green lights for "Clear: gates closed".

¹² If the CTC operator is unsure of a switch position on the panel, but he can be sure by sight that it's correct, he will bypass the control and light up this indicator in the fixed aspect (no bypass ever allows to clear the normal signal). If he is uncertain of the position of a switch he cannot see, he can bypass the control, light up this indicator in the flashing position and have the train driver check the switch position (if wrong, the driver will stop the train and throw the switch points manually).

When the driver sees a level crossing distant at yellow he must slow down enough to pass the level crossing home (if still at red) at a speed that allows him to stop the train by sight immediately before each level crossing (their number is on a sign on the signal mast). He can so be seen and heard (using the horn is mandatory) by the cars and only then he can cross the road at human speed (4 km/h). When the loco is beyond the road, the driver can accelerate again.

Direction indicators (*indicatori di direzione*)

These indicators consist of a set of light dots mounted on a black rectangular plate under the signal heads. When lit they show a number (0 to 9), telling the driver which route he will travel. It's up to the driver checking that the route is correct for his train and eventually stopping the train immediately if the route is wrong (even if the signal is clear). Possible routes are counted from left (1) to right and 0 is sometimes used for special routes (towards yards, depots, dead ends, etc.).

Other indicators (*altri indicatori*)

These letters or symbols may appear under the signal heads, in the same way as direction indicators:

- P The signal is now permissive: if red, wait for 3 minutes and then proceed at shunting speed (max 30 km/h) until the next signal is seen. In traindir the red aspect means always "Stop", so it's up to the player shunting the train and opening the signal with ctrl-click to have it passed at red.
- A "Advance" (may appear under exit signals only): line is clear, but a control signal is missing, preventing the signal to clear normally: the driver can leave the station even if the signal is red. If flashing (not simulated), the driver has to check the switch positions, (same as when the "Move on" indicator is lit).¹³ In traindir the red aspect means always "Stop", so it's up to the player shunting the train and opening the signal with ctrl-click to have it passed at red.
- D "Disabled" (may appear under home signals only): the station is disabled and the straight route through the station is locked in the switches, but a control signal is missing, preventing the signal to clear normally: the driver can enter the station even if the signal is red. If flashing (not simulated), the driver has to check the switch positions, (same as when the "Move in" indicator is lit). In traindir the red aspect means always "Stop", so it's up to the player shunting the train and opening the signal with ctrl-click to have it passed at red.
- ^ "Route continuation". When a station features more than one exit signal along the exit route, all of them are interlocked to clear together (all or none), but in practice it may be helpful to allow an entering or ready-to leave train to proceed beyond the first exit signal (up to the next). If that movement is safe, the CTC operator can manually light up this indicator, and the driver can proceed at shunting speed beyond the first exit signal and stop the train in front of the next. In Traindir this indicator lights up when the first exit is open at "Shunt" (using ctrl-click) and a fake 'V' station is present along the route to the next signal.
- C "Closed". The line or station is closed to normal traffic (which is prohibited) for maintenance, so maintenance vehicles or cars can circulate freely (by sight). Their operators are free to throw switches as needed. This indicator is not simulated.
- T "Telephone". The home signal is red because the CTC operator has something to tell the driver, so he should get down the loco and pick up the phone that is always installed nearby the signal. Nowadays all the drivers are given a mobile phone (restricted to the railway mobile network), so the CTC operator can almost always call them as needed in advance, without forcing them to stop at a signal. Exceptions are secondary mountain lines or long tunnels, where no field of the mobile network is present. This "old" procedure is one of the most feared by the drivers, as the almost never used telephone boxes are perfect places for bees and wasps to build their nest... This indicator is not simulated.

¹³ "A" and "D" are automatic indicators, used to minimize human checking and intervention at night and/or in disabled and unmanned stations, so they are allowed only when the straight through route is locked in the switches; "Move in" and "Move on" indicators are manually lit by an operator, and can be used on any route.

Signal aspects (*aspetti dei segnali*) for main and distant signals

Normal	Diverging ¹⁴	Meaning
R	R	“Stop”. Call the CTC operator to ask what to do; if not possible and the signal is not permissive, just wait until the aspect changes or someone arrives to tell you what to do. If permissive, wait for 3 minutes and then proceed by sight (max 30 km/h).
Y	RY	“Prepare to stop”. Line is clear at full or diverging speed, but next signal is at “Stop” or at “Prepare to stop within short distance” or at “Prepare to stop by sight”
YY	Not allowed	“Prepare to stop within short distance”. Line is clear at low speed (the previous yellow made the driver prepare to stop) but next signal is at “Stop” or at “Prepare to stop by sight” and is nearer than 600 m.
RYY ¹⁵	RYY	“Prepare to stop by sight”. The line is not fully clear, as the route goes towards a short track or towards an already occupied track (this aspect is used to join trains or to use the same station track for two short trains).
YG	RYG	“Prepare to slow”. Line is clear at full or diverging speed, but next signal shows a diverging aspect requiring a speed reduction to: <ul style="list-style-type: none"> - 30 km/h if the Y and G lights are fixed (YG) - 60 km/h if the Y and G lights flash together (Y_xG_x) - 100 km/h if the Y and G lights flash alternately (Y_x/G_x) Please note that the announced speed may be higher than the one enforced by this signal (if diverging), but it's always lower than line speed.
Y _x	RY _x	“Warning”. Line is clear at full or diverging speed, but the next signal shows “Prepare to stop” or “Prepare to slow” and it's nearer than 1200 m (standard distance) from the next signal.
G	RG	“Clear”: line is clear at full or diverging speed. No info is given about the next signal aspect, but the driver can safely wait to see it before taking any action.

R, Y, G = Red, Yellow, Green; the subscript _x means flashing

¹⁴ Diverging (a red on the topmost head, and something on the other) means restricted speed from this signal on, as told by the distant and eventually reminded by the rappel; the rest of the aspect is normal. Exit signals with the triangle show the normal aspects, and it's the triangle that indicates the speed reduction, at 30 km/h if empty, at 60 km/h if “60” is written in it (“imagine a red head on top”). The diverging speed must be kept until the last car has passed the last switch, or until the next signal is reached, or until the “beginning of plain line” sign is reached, whichever occurs first.

¹⁵ This is the only “diverging” aspect used also on the straight route, due to rule modifications. In the past the YY and RYY aspects were “regular” and meant “Prepare to stop by sight (track may end or be occupied), at most within 600 m”, for the straight or the diverging route respectively, and YG preceded RYY, like any other diverging aspect. Now both YY and RYY are always preceded by a Y (but RYY may be preceded by YY if it's at less than 600 m from the previous signal).