

AC EURAILER

July 2005



The Official Newsletter of the
Auckland märklin Club Inc
c/o 33 Buller Crescent, Manurewa, Manukau City, 1702, New Zealand

Club Officers

President:	Andrew Holt	(09) 446 0003	AndrewH@universal.co.nz
Vice President:	Jim Lyne	(09) 537-2177	J.GLyne@extra.co.nz
Secretary:	Brendan Van Dam	(09) 267 5306	bvandam@ihug.co.nz
Treasurer:	Brendan Van Dam	(09) 267 5306	bvandam@ihug.co.nz
Librarian:	Warwick Harman	(09) 626 5011	
Club Goods:	Rex Meijering	(09) 818 7561	
Editor:	Steve Siegel	(09) 638 4101	steve@solutionit.co.nz
Custodian:	Trevor Holt	0800 354 254	papercut@extra.co.nz

Next Club Meeting

- Location:** Clubrooms,
58 Victoria Street, Onehunga
- Date:** Monday, 11th July 2005
- Time:** 19:30
- Topic:** We will be Tinkering with Trains,
so please do bring your favourite
Lok, be it Digital or Analogue!



Clubroom Activity

Regular times for Clubroom Activity's

Second Saturday after Club night at 13:00hrs
23rd July 2005

Please note that the roller door is generally left down unless there is regular traffic, As long as you see a car parked outside please knock - bang - rattle the door to attract the attention of someone inside.

President's Report

This month I want to start by saying thank you to the members who have given of their time and materials to the club over the years. Thank you for those who have turned up on Saturdays to help move the club layout

on a bit further. Thank you to those who have volunteered for the exhibition at Milford during the week of 11th - 17th July. Thank you for our presenters who have entertained and educated us at the monthly

meetings and thank you to the members who have given track, scenery materials and other items to the club to assist with the refurbishment

of the club layouts. Thank you too to the members who have taken up official roles and contribute on a monthly basis to the running of the club.

The reason for mentioning the voluntary help is due to the contribution they are currently making with the exhibition in Milford and the assistance rendered at the Saturday workshop. Suffice to say, you won't recognise the clubrooms . . . and it's only half way there.

Our website is now correct again when it says you can run digital and analogue trains at the same time on the club layout, so come along and see in July . . . in fact come along with your favourite train in July, because the theme for the night is going to be train running, so we want to see your trains, hear your stories and take lots of photos of the club layout and members in action. No entry without a train!

The next Monday meeting is on the 11th July, which is also the day on which the exhibition at Milford Shopping Mall starts, right in the very centre of the

mall. Going from 10am to 4pm each day from Monday 11th July to Sunday 17th July, we will be on display with Maurice Handisides' HO Layout, Reg Tyson's HO Layout, the Holt's Z layout along with Reg's ride on Thomas and Reg's friend's British layout. If you can help out, give me a call (I will be there every day, so you don't need to fear that you will be left holding everything).

The last thing I have left to mention is the website. Firstly we are still waiting for photos and details of the other members' layouts, so get them in to < steve@solutionit.co.nz > or < webmaster@marklin.org.nz > or bring your stuff to the clubnight. Secondly, people are starting to look at the site and as a result I have contact with 2 people who are unfortunately moving out of Marklin and have items for sale . . . details once again on clubnight . . . with trains running, layout details being collected, cameras flashing, a number of items for sale and another little item of interest up my sleeve, it's going to be a busy night!

See you there,
Andrew.

Cover Photo's
*Warrick Harmon's
Classic Marklin Layout*

Library Report
*Marklin Insider
2/2/05 - 3/2/05
Marklin Magazine
April/May and June/July 05*

Excerpt from an anonymous author via the internet.

A Digital Introduction.

The following provides a description of the components required for basic Märklin digital train operation. It assumes model numbers and equipment at the time of writing (January 2002), and is provided as a means for gaining a basic understanding of the various components available from Märklin. At this stage, no attempt has been made to include or describe substitute digital components manufactured by other companies.

What is Märklin Digital ?

Simply put, Märklin Digital offers a way of controlling everything on a model train layout digitally, using state of the art integrated circuitry. The benefits include less wiring, greater realism, and the ability to control many special effects - such as train whistles and smoke generators - at the press of a button. It consolidates all previous technologies required to realise the full potential of a train layout into one standard system.

Which Type of HO Track to Use ?

Märklin C, M and K track all work with Märklin Digital. However, from 2001 M track is no longer being manufactured. C track, being the latest, offers a number of advantages over K track including the ability for turnout decoders to be housed within the track itself. In this arrangement there is no additional wiring required for the remote switching of turnouts. All signals are received from the same brown and red wires which provide the

layout with power.

A Word on Locomotives

The latest digital locomotives from Märklin are electronic masterpieces. Functions such as sound effects and lights can be controlled via the Control Unit independent from locomotive motion. For example, lights and smoke generators can be switched on and off even when the locomotive is stationary. The latest locomotives contain propulsion units which include the means to set speed parameters such as acceleration and deceleration delay, and top speed. The ability to accurately model real life locomotive motion and prototypical speeds has never been more easily achievable, and adds a level realism to locomotive operation which is truly outstanding and fun to operate.

Delta locomotives will run perfectly well on a digital layout but the difference between Delta and Digital locomotives (with respect to the additional functionality of Digital locomotives) is considerable.

Conventional (pre-digital/delta) locomotives will run correctly *only* if they are retrofitted with a digital decoder.



^ 6647

or



^ 6002

Digital Components

1. The Transformer

As with all train layouts, a Transformer is required to provide power to the layout from a conventional household power outlet. In a Märklin digital layout, however, the Transformer is not connected directly to the track but is connected to the Control Unit (see below) which in turn is connected to the track. The black accessory Transformer such as the model 6002 pictured above provides 52 VA and caters easily for the additional power requirements of the Control Unit and other accessories. However, any conventional Märklin Transformer such as the white Model 6647 pictured above and included in most starter kits can be used. In this configuration the speed dial becomes inactive (speed is controlled via the digital Control Unit - see below). If you're starting from scratch the more powerful 'black' series will provide for some expansion in the future. Only one Transformer is required to get started but as the size of a layout increases, additional Transformers may be required to cater for increasing numbers of locomotives and accessories (see below for more details).



^ 6021

2. The Control Unit

The "computer-like" Control Unit is the nerve centre of every Märklin digital layout. It provides the 'brains' behind controlling locomotives and accessories and is

the first and basic required piece of equipment (aside from a Transformer). It also provides the point at which wires are connected to the layout.

In the first instance you use the Control Unit to "drive your train", and just like a conventional Märklin Transformer it has a dial which is used to accomplish this. In fact the Control Unit provides the means by which you can independently set the speed and direction for up to 80 locomotives and control associated functions such as whistles and smoke generators. However, unlike a conventional Märklin Transformer there is no power lead - in fact it is not a Transformer at all! You need to connect a Transformer to the Control Unit to provide it and the layout with power.

Apart from the speed dial, the Control Unit also includes a number of buttons. Briefly, the left hand numerical buttons are used to select the locomotive you wish to control. Above the red dial are the function buttons which are used to activate additional functions on the locomotive (where fitted) - such as whistles and lights. There is also an emergency stop button - if things get out of hand when operating multiple locomotives!

IMPORTANT: The Control Unit itself *does not* provide the means to control accessories such as turnouts and signals. Although it provides the interface for digital operation to the track, its onboard features only include the control of locomotives and associated functions. To control accessories such as turnouts you need another digital device - the Keyboard 6040.

The Control Unit has ports on either side (not shown) in which additional

digital devices, such as the Keyboard 6040, are attached.

NOTE: Only *one* Control Unit is required for any layout (regardless of size).

In summing up, the Control Unit does two things:

1. It acts as the interface to the layout for all other digital control devices including the transformer.
2. It provides for the control of locomotives and their associated functions.

You need both a Transformer *and* a Control Unit as the two basic ingredients for which to power and operate a Märklin digital layout. The Transformer provides power to the Control Unit which in turn is connected to the layout through the conventional brown and red wires. (Of course you also need at least one locomotive capable of digital operation). The following pictures represent the basic requirements: (**NOTE:** Transformers are connected to the Control Unit via brown and yellow wires - not shown). Remember, in the second of these two possible scenarios, the red dial on the white Transformer is inactive. The Transformer is being used only to provide power to the Control Unit.



^ 6021



^ 6647

3. Controlling Accessories The Keyboard

Of course virtually every accessory from turnouts to signals can be controlled digitally. As a logical next step in expanding any layout, turnouts can be modified to allow remote switching using the Keyboard 6040. This device allows the switching of 16 turnouts, but can also be used to control signals and other solenoid activated devices. Additional keyboards can be added to provide control of up to 256 accessories through one Control Unit.

Together with the Keyboard, you also need a digital decoder which is connected to the accessory



^ 6040 Keyboard

and there are a number of options to choose from including decoders which can handle 4 accessories. The digital decoder translates instructions from the Control Unit and acts as the interface between the digital Control Unit and the solenoid. In the case of C track turnouts, a specially designed decoder is available which can be attached directly to the solenoid under the track eliminating the need for



^ 6021



^ 6002

or

external wiring. The decoder receives instructions via connections to the track. The same red and brown wires which provide power to the layout also provide digital information. This effectively means that you only have two wires connected to the entire layout!

Keyboards attach directly to the Control Unit via a port on the left hand side of the Control Unit. So a basic digital system which includes a Keyboard for accessory control looks like this:



^ 6040 Keyboard

^ 6021

^ 6002

4. Additional Train Control

While the Control Unit provides independent control of up to 80 locomotives, only one locomotive at a time can be controlled via the speed dial. If you select a different locomotive, the previously selected locomotive continues running at the speed it was set to. If you want to simultaneously control more than one train, or if you want to provide control for other people around the layout,

you need to add one or more Control 80 f units. The Control 80 f attaches to the right hand side of the Control Unit, but can be placed anywhere around the layout and connected to the Control Unit via an



^ 6036 Control 80f

extension cable. Multiple Control 80 f units can be attached side by side. Despite the similarity in appearance, the Control 80 f is not the same as the primary Control Unit and the two are *not* interchangeable.

5. Additional Power

As a layout grows, so does the requirements for power increase and additional Transformers need to be added. Under most circumstances this is accomplished through isolating sections of the track - similar to conventional non-digital layouts. In a digital layout, however, Transformers are attached to these new sections via a Booster which is also connected to the Control Unit via an interface cable. The Booster provides the interface between the Transformer and the layout but also 'boosts' the digital signals from the Control Unit.

In a digital layout you need a Booster for each additional Transformer. The Transformer is connected to the



^ 6017 Booster

^ 6002

Booster via brown and yellow wires (not shown), and the Booster in turn connects to the track section via red and brown wires. The Booster is also connected to the Control Unit via an interface cable. Additional Boosters are attached to each other to receive digital information, so that while

you may have many Transformers and Boosters, you only ever have ONE Control Unit. In particularly large layouts which use many Digital input devices (Keyboards and the like), a dedicated Transformer may be required to power the Control Unit and Keyboards or an array of decoders. In this scenario, the Control Unit is not connected to any section of track - instead, Boosters are used to “power” individual sections of the layout - taking their signal from the Control Unit via the interface cable.

See the connection examples at the bottom of the page for a clearer picture on connecting additional Transformers and Boosters.

6. Automation

The beauty of a digital system is the capability for true computerised and automated route control. This is primarily achieved in two ways:



^ 6043 Memory Unit

(a) The Memory Unit 6043 can store 24 routes each with 20 turnouts or signals. You pre-program the settings for up to 20 accessories and at the push of a button the route is automatically set.

As with the Keyboard, additional Memory units can “piggy backed” together.

(b) The Computer Interface 6051 allows control of the entire layout via a personal computer for complete automation. Software is available from Märklin, and from a host of developers both freeware and otherwise on the internet. Practically every aspect of digital train and layout operation can be accomplished through a computer,

and therefore the Interface can be a cost effective alternative to the purchase of Keyboard and Memory units for those who are “computer

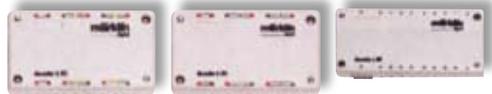


^ 6051 Interface

savvy”.

7. Decoders

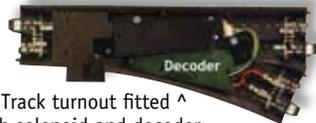
The digital devices discussed so far represent the “input” side of the digital layout. At the other end - where all the action takes place - we need a decoder to ‘translate’ the instructions from these input devices. There are a variety of decoders available which perform a number of functions. There are decoders which can be installed into older locomotives for operation on a digital layout, as well as a plethora of decoders for accessories such as turnouts and signals. Needless to say, almost every locomotive and accessory can be controlled digitally. Here are some examples.



^ K83

^ K84

^ S88



C Track turnout fitted ^ with solenoid and decoder



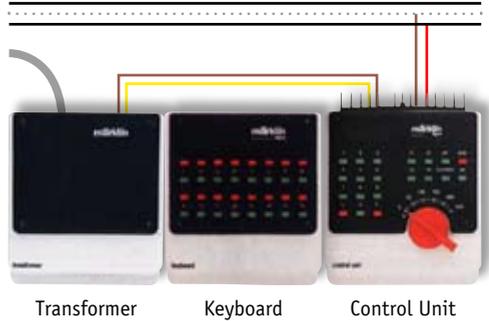
^ 60901 High-Efficiency Propulsion set.

A WORD OF WARNING: In a digital system, constant voltage is supplied to the track. Older locomotives which have not been modified will run at a constant speed in one direction only

Connection Examples

The following diagrams illustrate basic device connection with the exception of accessory decoders. The coloured lines represent wires which connect the primary devices and the track.

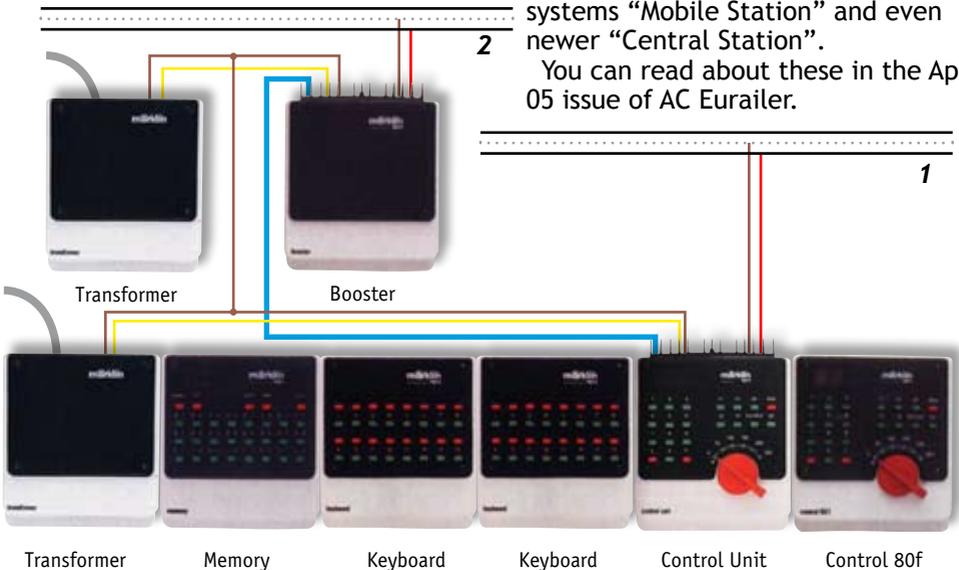
(a) To the right a simple layout with one Transformer, one Keyboard and the obligatory Control Unit. Only one set of track wires is required to provide the layout with power and digital information. As the layout grows an additional set of feeder wires should be used to provide power to the other side of the track.



(b) Below a more complex layout with two Transformers, Memory, two Keyboards and a Control 80 f. The Control Unit is connected to the Booster via an interface cable (blue). The two track sections are electrically isolated from each other.

These older examples of the digital system have now been fairly much superseded by the newer Marklin systems “Mobile Station” and even newer “Central Station”.

You can read about these in the April 05 issue of AC Eurailer.



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The HP Signal System

The Hp system was tested by the Deutsche Reichsbahn in 1928 and introduced into the Signalbuch (signal code) in 1935, however few colour light signals were erected before the end of World War II. The main usage was and is in West Germany.

The aspects are the same as the night aspects of the Semaphore Signals. Its signals consist of home signals which are at least capable of indicating "stop" and "clear". The home signals (Hauptsignal) may show "line clear with medium speed" as well as some other aspects like "stop, shunting permitted" or give an indication of what speed exactly is allowed (by a speed indicator Zs3). At 400 m - 1000 m before the home signal, a distant signal (Vorsignal) is showing the aspect the driver has to expect at the home signal. If the visibility is limited, additional distant signal repeaters (Vorsignalwiederholer) may be used.

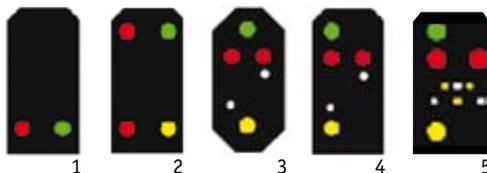
If the block length is about 1000 m, the position for the distant signal for the home signal in advance comes close to the position of the home signal in rear. In this case, the distant for the home signal in advance is usually mounted at the post of the home signal in rear, you will find this often with entrance signals.

Signal Heads

There are different signal heads in use, depending on the supplier and/or the aspects that are to be displayed. These heads vary slightly in shape (corners may be angled or not) and in the arrangement of lamps. The signal indication does not depend on where

in the head the lamp is placed.

Here are some examples:



1 This one can just say 'clear' or 'stop', usually used with block signals.

2 This one can also display 'clear with 40 km/h', the lower red is an emergency red which lights if the 'main' red fails.

3 & 4 These two can display the (now obsolete) 'double-red' Hp00 as well as 'shunting permitted', this is most probably an exit signal.

5 This is a compact head equipped with additional lamps.

Exit Signals

Exit signals are placed at the end of each track. Especially in stations with curved tracks the exit signals must be placed in a line that crosses the tracks either perpendicularly or diagonally, so that the signals appear in the same order, regardless of where the viewpoint is. On branch lines the exit signals may be omitted when the exit speed does not exceed 60 km/h.

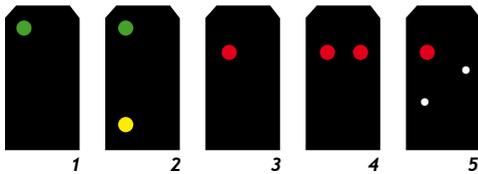
To maximise the usable track length in a station, the signals should be placed as far as possible to the point area. On converging tracks however, since the signals also protect the following point(s) and movements on the other tracks, there must be sufficient distance between the exit signal and adjacent points or other tracks.

On freight yards or freight tracks Group Exit Signals may be used. This is a single signal placed after the last point where all tracks it governs

join. Additionally at the end of each individual track a high line-close signal (Sh 0/1) is placed to be able to show which track exactly is cleared with the group exit signal.

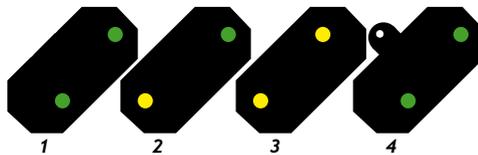
Please note that a clear exit signal does NOT permit a halting train to depart - this is accomplished by the departure order signal.

Home Signal Aspects



- 1 Hp 1: line clear (with timetable speed)
- 2 Hp 2: line clear with slow speed (40 km/h if not indicated otherwise)
- 3 & 4 Hp 0: stop*
- 5 Hp 0 + Sh 1: stop, shunting permitted

Distant Signal Aspects



- 1 Vr 1: expect clear
- 2 Vr 2: expect clear with medium speed
- 3 Vr 0: caution, expect stop
- 4 distant signal repeater or home signal at reduced

* For the double-red aspect, see peculiarities. For the rules applying to a signal showing Hp 0-stop or at failed signal see also post plates.

Peculiarities

The Hp 00 aspect

That there are two aspects for 'Stop' pertains to the fact that in older rule books (Signalbuch), the signal Hp 0 (a single red light) meant 'stop for train movements', but shunting movements were to completely ignore this signal. So a new aspect Hp 00

(two reds) was introduced meaning 'stop for train and shunting movements' while Hp 0 (a single red light) meant 'stop for train movements, shunting movements ignore this signal'.

Later it was felt that a red light should be a red light, i.e. red should equal stop always. (Note this is opposed to the U.S. practice of "If it's not all red, it's not red at all", see page "do American signals make sense?") So the meaning was changed according to this: A red light (Hp 0) was stop for everyone. Hp 0+Sh 1 (red + two whites) was used to say "stop, shunting permitted". As you might expect, the second red lamp was obsolete by now. As you might also expect, one could simply remove that bulb. But alas! The signals are wired such that the failure of a lamp is detected (which does make me feel much safer riding trains!), so you would have to re-wire the security equipment at the signal boxes. Since that would have become too expensive it was considered covering the second light with adhesive tape (no kidding!). But, smart as we Germans are, we found a way much better: The signal book states that the signal aspect Hp 0 (stop) is "one red light or two red lights arranged horizontally".

The German Question

(This expression was used before 1990 in Germany for the Division of the country.) As with railways, until now there still exist two Signalbücher (Rule Books). Since some things have really developed differently, that is understandable, but there are some other things that are so different that you wouldn't imagine, so I shall present a few quotes here. In the

text below are the DB (West) and the corresponding DR (East) text, the differences are *Highlighted*.

Description of semaphore aspect Hp 0 (stop)

DB A signal arm - on two-armed signals the upper arm - points horizontally to the right.

DR *The* signal arm - on two-armed signals the upper arm - points horizontally to the right.

Description of semaphore aspect Vr 2 (expect clear)

DB The round disc lies horizontally [flipped backwards]. *Where a wing is present, it points straightly downwards.*

DR The round disc lies horizontally [flipped backwards]. *The wing points straightly downwards.*

Description of speed reduction signal board Zs 3

DB A white *digit* on a black triangular board with a white border.

DR A white *number* on a black triangular board with a white border.

Description of Lf 3 board (end of speed restriction)

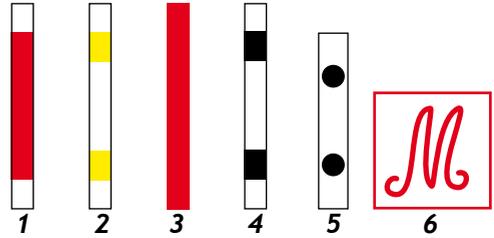
DB A rectangular white board showing a black "E" *standing on the shorter edge.*

DR A rectangular white board showing a black "E". *[note: this one also stands on the shorter edge...]*

Post Plates

Post plates determine the rules that apply when a signal has failed. Most signals carry a post plate mounted on the signals post below the signal head

Home Signal Post Plates.



1 Train movements may pass a stop signal at danger or a defective home signal only if aspect Zs 1, Zs 7, or Zs 8 is displayed, or signalman hands over or dictates a written permission to do so. Shunting movements may pass it by a verbal permission. Used for entrance, exit, and protecting signals, or automatic block signals covering level crossings or sidings.

2 Same procedure as post plate white-red-white. But if driver is unable to communicate with signalman, train may pass the signal and may proceed on sight until next home signal. Used for automatic block signals.

3 This post plate is used in two regions, where it has different meanings: *In Berlin only:* Urban railway lines for some entrance or exit signals on lines with automatic block equipment. Same procedure as post plate white-red-white, but after train has obtained signalman's permission to pass the signal (or after aspect Zs 1 was cleared) train must proceed on sight until next home signal. Shunting movements may pass it by a verbal permission when at danger or defective. *On the Augsburg-Donauwörth line only:* Identifies a Sk home signal.

4 Used only on Berlin and Hamburg urban railway lines for automatic block signals. Combined Signal is permissive, train may pass it without permission when at danger or defective. Proceeding on sight applies until next home signal.

5 Train movements may pass the protecting signal at danger only if signalman hands over or dictates a written permission. Extinct protecting signals are not valid for train movements. Shunting movements may pass it by a verbal permission when at danger or defective.

6 M-Board. Used on signals with white-red-white white-yellow or red post plate. Train may pass a home signal at danger or a defective home signal also by a verbal order of the signalman to prevent delays.