

Wickham

Every once in a while a ready-to-run model of a surprising rail vehicle is launched. Bachmann's Wickham Trolley is such a model, but it was offered in DC only. **PAUL CHETTER** describes how he added DCC sound and lights without destroying its essential character.

THE DIFFICULTIES of fitting a Digital Command Control decoder to Bachmann's delightful and intricate model of the Wickham Type 27 Trolley are pretty obvious even at first glance. Even in 'OO' gauge it is tiny and virtually see-through. The comparison with the Class

03, itself quite a small locomotive, puts this model's size into sharp perspective.

To make this a working model the motor has migrated to the attached wagon, below the simulated ballast load, while the trolley provides the important purpose of expanding its wheelbase to increase the number of pick ups

available to keep the Type 27 on the move – see HM114 for a full review of Bachmann's Wickham.

As you will see from the photographs in the Step by Step guide, there are no usable voids in the wagon or the trolley's chassis for a sound decoder, let alone a speaker, which makes this something of a challenge – but

Fitted with a crew, exterior lighting and a hidden decoder and speaker, the Bachmann Wickham really can accommodate a lot of equipment.

SOUND FITTED

STEP BY STEP INSTALLING DCC SOUND AND LIGHTS IN A WICKHAM TROLLEY

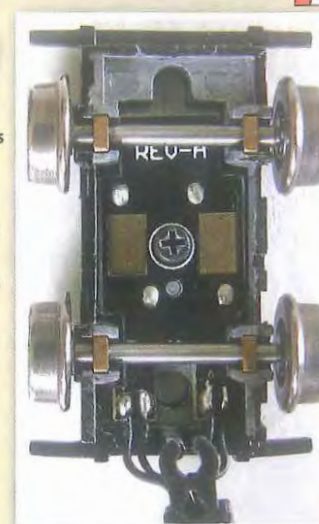
Beginner **SKILL LEVEL** Intermediate Advanced



1 To begin the installation the trolley body needs to be dismantled. The body can be removed after releasing the two cross-head screws in the keeper plate.



2 The keeper plate remains clipped in place, so must be gently prised from the metal chassis frame.



3 Note the axle bearing arrangements. The incomplete circle of the front of the drawbar can be seen detached from the peg on the chassis.

one which I was more than willing to take on to discover how much is possible with the Wickham and digital operation.

I normally ensure that my installations are invisible, but with this particular model, I decided that a Zimo MX648 decoder and modified 10mm x 15mm 'sugar cube' speaker could be fitted into the roof such that neither would be visible from most viewing angles. This would retain the 'open' character of the model and allow the addition of a driver and passengers to further enhance its interior and distract the viewer's eye from what else is tucked away inside.

Single headlamps at front and rear are prominent features which I thought could be made operational by using DCC Concepts 'Nano' LEDs and this proved possible. Make no mistake, this is not a simple installation, so read the whole feature before deciding if it is for you. Your warranty will almost certainly be adversely affected.

DISMANTLING

Although I removed the wagon superstructure for my initial inspection of available space, there is no need to do so as all the work will be carried out on the trolley.

Removing the two screws beneath the chassis will allow the body to be removed by lifting it straight upwards. The running gear remains held in place by the keeper plate which clips onto the metal part of the chassis. I used a small screwdriver blade to prise these apart.

Be careful not to disturb the axle mountings during this process, at least until you have noted the positions of the wheel wipers and axle bearings. The bearings are square brass plates with holes for the axles. They are a snug fit and must be very precisely aligned before they can be refitted to their slots in the chassis. These need to be removed for access.

I released the trolley's main Printed Circuit Board (PCB) by removing the single screw

holding it in place. You will notice that there are four black wires soldered at the rear of the PCB, but the labels show that the track pick-ups are the outer pair and the inner pair are for the motor. I confirmed this by disconnecting the motor wires and testing with a Digital Multi-Meter (DMM).

It will be important to be able to distinguish between motor and track wires when connecting to the decoder, but multi-coloured wiring can be a little too obvious when in plain view. I used fine black wires for track pick-ups and fine dark brown wires for the motor wires, each around 100mm in length to give enough play later. The 'polarity' within each pair can be ignored since the decoder can be programmed to the correct direction of travel.

As the joins in the motor wires are close to the solder pads for the pick-up wires it is essential to provide adequate insulation. Clearances in this area are very tight so heat shrink tubing might prove to be too bulky. A satisfactory and durable insulating layer can be made in situ by applying nail varnish to exposed metal. I used white for photographic purposes.

The wires were fed through the gap in the metal chassis, the PCB reinstated, axles relocated and keeper plate refitted. Pay particular attention to the pick-up positioning; it's easy to lock the wheels with them.

SUPER-STRUCTURE

With the chassis reassembled and the wiring tested attention turns to the superstructure of the trolley, where all the remaining work will take place. The wires will pass from the top of the engine cover to the roof between the windscreens, so I drilled a couple of 1mm holes in the top of the engine cover (from beneath) directly behind the front panel then connected them to make a slot for the wires to pass in parallel.

To facilitate fitting of wires and hole drilling and to avoid fogging with the fumes from cyano adhesive I would be using, I removed the glazing from each end. At the rear, this also includes removing the rear bench backrest. This involves separating glued components, so much care is required to prise them apart without damaging them.

The dummy headlamps are solid plastic >>



mouldings. To prepare them for LED installation, I marked the centres of each lamp with a bradawl prior to drilling through each lamp and continuing through the body, using a 0.4mm drill in a pin vice. This serves to pass the wires from the NANO LEDs to the inside of the body and to provide a guide for the 2mm drill I used to create a cavity in the body of each lamp.

The lamps are fitted to the body with a small bracket which could easily be twisted off. I used a pair of forceps to stabilise the lamp whilst drilling. I checked the depth regularly until the NANO LEDs would fit flush with the front of each lamp. I tested each LED (remember to use a 1k Ohms resistor in series to protect from over-current) before flooding the lamp with cyano adhesive. This fixes the LED in place and creates a transparent protective face to the lamp.

The wires were directed into the roof space in the gap between the pairs of windscreens, and the whole put aside for the adhesive to cure.

DECODER PREPARATION

Because of the limited space available, using the decoder as delivered isn't going to be possible – it needs reducing in size through a couple of simple steps. First the MX648 decoder had its heat shrink insulation removed and then all attached wires to make

WHAT WE USED		
PRODUCT	SUPPLIER	PRICE
Zimo MX648 Sound Decoder	www.digitrains.co.uk	£99.00
Zimo 10mm x 15mm x 11mm cube speaker	www.digitrains.co.uk	£9.00
Protowhite NANO LEDs	www.dccconcepts.com	£13.00
Preiser seated workmen	www.gaugemaster.com	£15.00

way for those fitted to the model earlier.

A standard 'sugar cube' speaker enclosure is far too deep to successfully nestle within the arch of the roof.

I removed the black plastic enclosure and fixing gasket from the speaker driver then used cyano adhesive to fix a styrene sheet cut to size in its place. I have found that provided there is a perfectly airtight seal this allows a reasonable sound output.

When this had cured, I used a warding file to shape the styrene to match the arching profile of the roof, speaker fitting longitudinally. The spring connectors were cut back to reduce the speaker's overall height and fine black wire soldered to each stub.

I refitted the glazing and seatback, made loose coils in the trimmed wires to allow movement for installation then soldered them to the appropriate pads on the decoder and including a series resistor in the common positive.

I similarly connected the speaker wires to the decoder before positioning the decoder transversely within the rear portion of the roof, with the speaker in the front.

These can be seen if looking upwards into the roof space, but nothing shows below the roofline apart from a couple of small components on the decoder and the wires running up the pillars between the windscreens, so from normal operating viewpoints and distances they will not be visible.

To give the unit a sense of purpose, I fitted some seated figures from Preiser, supplied by Gaugemaster, in appropriate period clothing.

One of my own custom sound projects loaded to the decoder adds the final flourish to a model destined for Permanent Way duties on Grosvenor Square and you can see this model in action during the Great Central Railway Model Event on June 16-18 on the *Hornby Magazine* stand. www.hornby.com

Showing the true tiny size of the Wickham, this is the out-of-the-box model posed alongside a 'OO' gauge Class 03 diesel shunter.

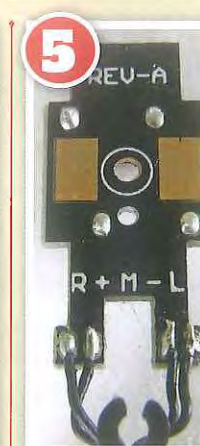


STEP BY STEP INSTALLING DCC SOUND AND LIGHTS IN A WICKHAM TROLLEY

Beginner **SKILL LEVEL** Intermediate Advanced



The slots for the bearings have tight clearances and each bearing must be precisely aligned before it can be pushed home.



After releasing the single screw I removed the Printed Circuit Board (PCB) for easier access to the solder pads.

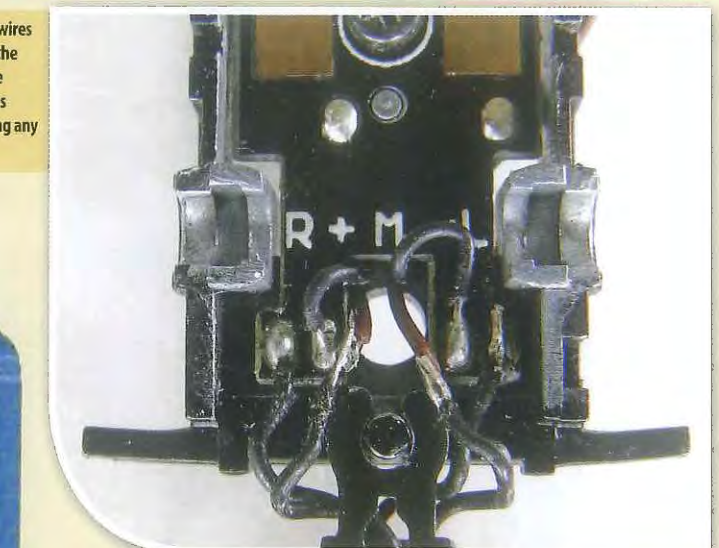


I disconnected the inner pair of wires labelled M+ and M- and tested them with a DMM and 12V power to confirm that they were the motor wires.

I attached fine brown wires to these and added a pair of black wires to the PCB having first confirmed that these connected to the track pick-ups.



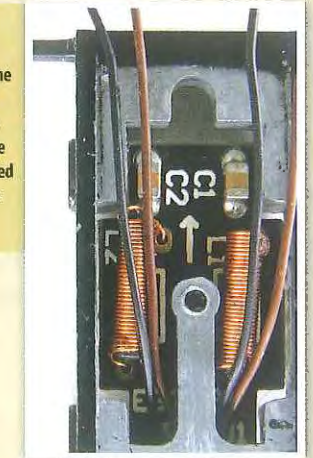
The PCB was refitted and all four wires were passed through the hole in the PCB. Since this is where one of the attachment towers from the body also passes through, care must be taken to avoid pinching any wires during reassembly.



Close proximity of bare soldered joints means that insulation must be provided. I used nail varnish to provide an effective, insulating coating for all bare metal in this area.



Viewed from above, the four added wires can be seen in the upper part of the chassis ready to be fed through the body to the decoder.



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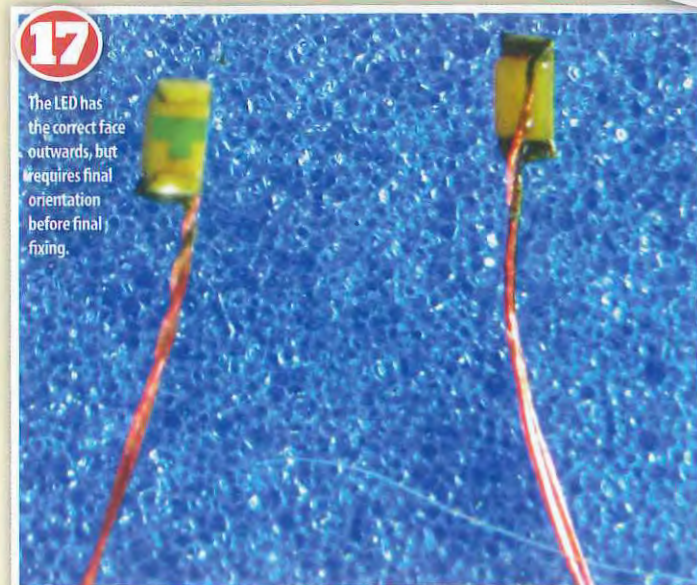
11 The model has no provision for working lamps, yet the lamps at each end are quite a prominent feature. I thought these could be enhanced with tiny LEDs.



13 I held each lamp with tweezers whilst producing the required void for the LEDs with a 2.0mm drill, also in a pin vice. This stops the lamp body twisting and snapping from the cab front.



14 I removed just sufficient material to allow the LEDs to sit flush with the face of each lamp, testing the depth often.



17 The LED has the correct face outwards, but requires final orientation before final fixing.



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In order to pass the lacquered copper wires to the decoder I drilled through the centre of each lamp and through the body with a 0.4mm drill in a pin vice.

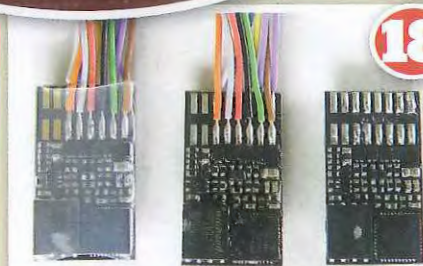


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The DCC Concepts 'NANO' LEDs are a convenient way of adding illumination in small spaces. Each consists of a Surface Mounted Device (SMD) LED, in this case with 'soft white' characteristics, to which a pair of single strand lacquered copper wires have been attached. The cross of the 'T' symbol denotes positive; the longer of each pair of wires is soldered here. This is also the reverse face of the LED, so the right hand LED shows the face to be orientated outwards.



16 This shot shows the wires passing through the lamp and central pillar. An indication of the depth can also be made out by the dark inner rim of the modified lamp.



18

Moving to the decoder, the Zimo MX648 is prepared by stripping its insulating sheath, then removing all wires to reduce bulk. On the left is an as delivered decoder moving across to the bare decoder on the right. Absolute care is required when soldering to a decoder.



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The speaker was prepared by removing its enclosure and replacing it with a sized flat styrene sheet fixed with cyano adhesive. The styrene was filed to match the arched shape of the roof.

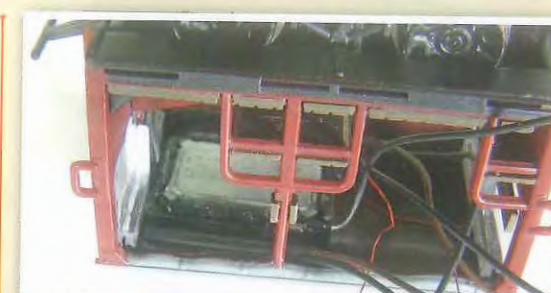


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A slot was formed (from below) in the top of the engine cover for the pick-up and motor wires from the chassis to pass up the inside of the front pillar as the trolley body was refitted to the chassis.

TIP

Finding a neat route for wiring makes a big difference on any digital sound project.



21

The modified speaker was fixed centrally in a longitudinal orientation, allowing wires from the chassis to pass either side on the way to the decoder.



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All wires were soldered to the MX648 which was in turn fitted to the inside of the roof, seen here before final fixing.



23

These seated workmen from Preiser were selected to provide a driver and some passengers for the trolley.



24

With the driver on board, the front lamp was illuminated and brightness adjusted with CV60 on the MX648.

TIP

If you are short of space nail varnish is a handy means of creating electrical insulation in models.

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This illustrates that although the LED is rectangular in shape, the light emitted fills the whole of the lamp giving a circular disc of light.

