COMPACT 'Clayton'

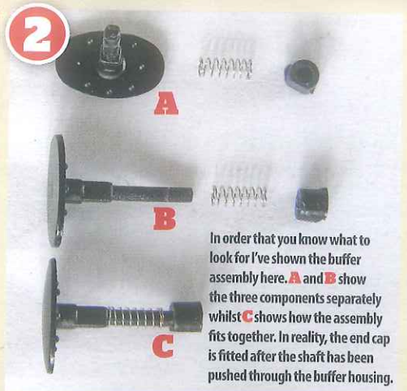
The distinctive shape of the 'OO' gauge Heljan Class 17 sets it apart from any other diesel on a layout. **PAUL CHETTER** describes the installation of DCC sound and 'stay alive' capability to bring the model to life and run more reliably than the real thing.

Heljan's Class 17 has been a popular model since it first arrived on the scene in 2009 (HM24). D8600 shunts the yard at Shortley Bridge as a Thompson 'L1' 2-6-4T arrives with a passenger working.

STEP BY STEP **INSTALLING DCC SOUND AND 'STAY ALIVE' IN A HELJAN '17'**

Beginner — Intermediate — Advanced — SKILL LEVEL

1 The first section of this guide is common to both installation variations. The buffer shafts will prevent the body from being removed from the chassis so will need to be removed. Release the end cap (red arrow) from each buffer shaft (yellow arrow).



2 In order that you know what to look for I've shown the buffer assembly here. **A** and **B** show the three components separately whilst **C** shows how the assembly fits together. In reality, the end cap is fitted after the shaft has been pushed through the buffer housing.

3 After removing the buffer shaft end caps, the buffer can be pulled from the buffer housing. Note the tiny spring. Repeat for all buffers and put the parts aside for safety. I removed these with the model inside a large plastic bag to retain any flying parts.

DESIGNED at a time when fitting an 8-pin socket was enough to qualify a model as 'DCC ready' there was certainly no consideration of dedicated provision for Digital Command Control (DCC) sound in the 'OO' gauge Heljan Class 17 'Clayton' diesel. This is a pity as conversion could have been made very simple with planning from the outset of the model's design.

Unfortunately, some idiosyncratic design features make opening the locomotive far more difficult than necessary which has potentially put some owners off sound installation. I'll highlight the problems and show you how these can be overcome with a little care and some dexterity. The model requires no modification and apart from soldering some wires, no special skills are required.

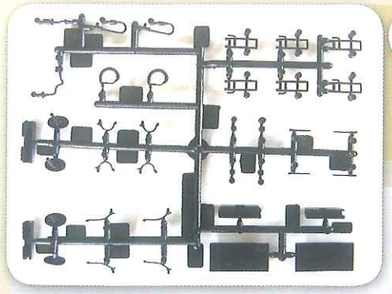
I think this is a largely straightforward and wholly worthwhile project as the twin Paxman engines produce a sound like no other, giving variety amongst other locomotive sounds. I have created a sound project for Zimo decoders from recordings of the sole surviving Class 17 preserved on the charming Chinnor and Princes Risborough Railway.

GAINING ACCESS

The body separates from the chassis in sections. The centrally located cab can be lifted vertically to remove it. The moulding is held by tabs only so there are no screws to remove. I found it easier to carefully insert a thin blade at the base of the cab, gently prising outwards and upwards to release the tabs on one side then the other of the model. Note the inset doors and the tablet catcher panel cut-out - these may interfere with the decoder installation so it's important to plan the installation correctly to avoid this.

To gain access to the 8-pin DCC socket and the space available for speaker accommodation, it is necessary to remove the rest of the body. As there are no fixing screws this should be a simple task but the shanks of the buffers extend behind the buffer beam sufficiently to prevent the body from being removed. Each buffer consists of three parts: the buffer and shaft moulding, a tiny spring and a small cap which serves to retain the assembly within the buffer housing. »

Intermediate
Beginner SKILL LEVEL Advanced



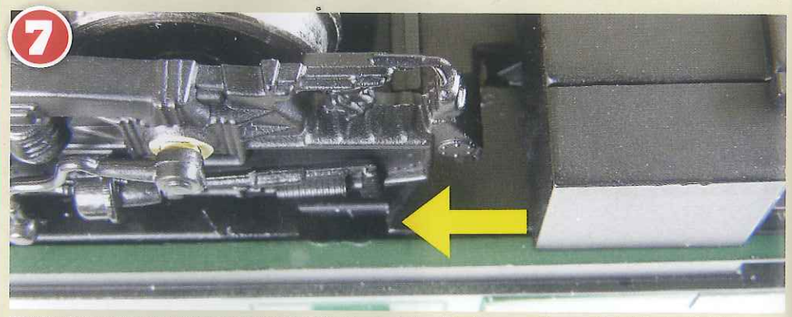
4 If you should mislay any of the buffers or end caps they can be obtained as part of a sprue of parts. Visit *www.howesmodels.com* for the full range of Heljan spares.

TIP

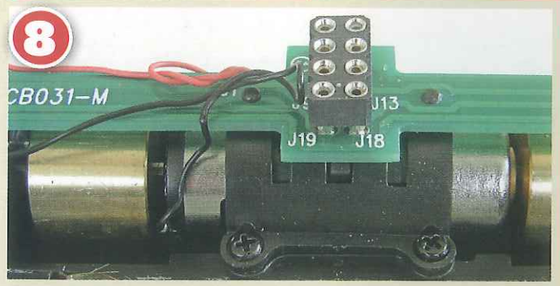
- **Ensure any metal surface is fully insulated with a suitable medium for reassembling the model. This can be as simple as using Kapton or electrical insulating tape to protect wiring from coming into contact with bare metal surfaces. Simple, but effective.**

5 To remove the cab moulding, insert a flat blade into the joint with the solebar and ease the cab sides outwards and upwards.

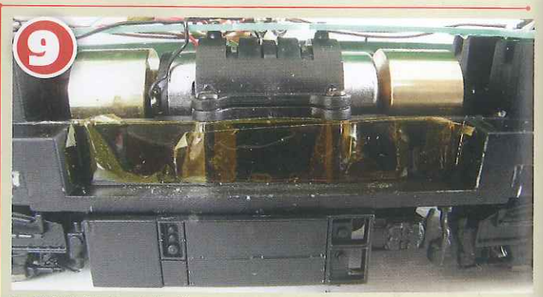
6 The cab is fixed in place by clips at the centre front and back of the cab below the exhaust. Corresponding slots are located in the engine room roof panels.



7 With the cab removed, the rest of the body can be released from the chassis. Four fixing tabs are used to secure the body in place. Slots in the chassis casting (arrowed) indentify their location. Using a small flat bladed screwdriver in these slots to prise the body sides apart slightly will facilitate the separation.

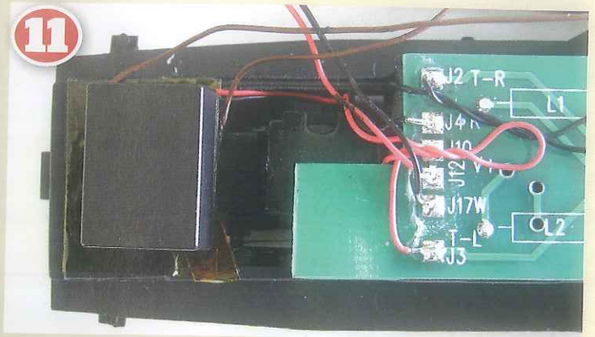


8 With the body removed, the central motor and 8-pin connector can be seen clearly. Here the blanking plug has been removed.

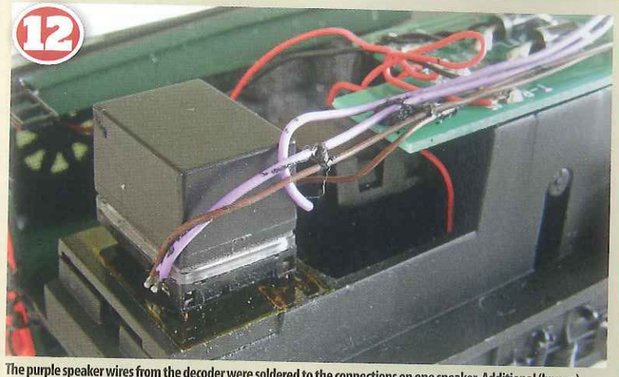


9 The MX645R will be installed in this space at the lower side of the cab. I insulated the chassis in places where solder pads or components may make contact in use.

10 I also use Kapton tape to insulate the chassis where the speaker terminals would come into contact with the chassis at each end.

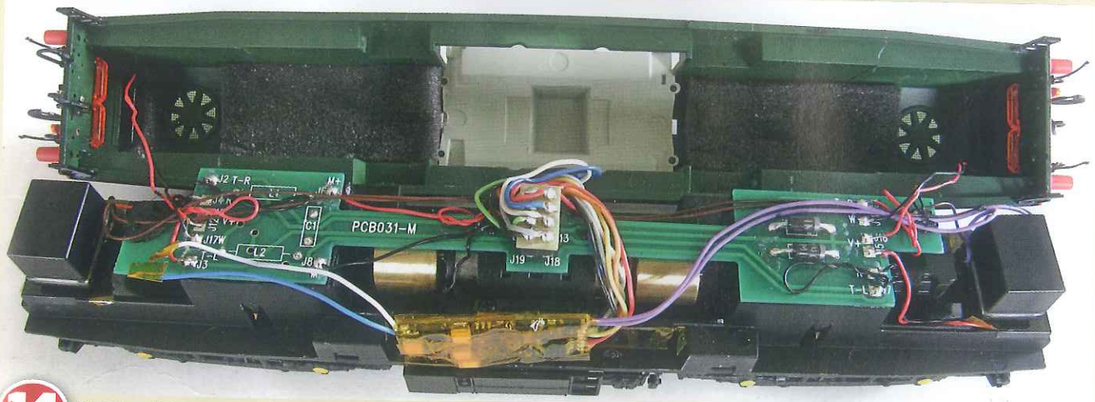


11 In the first variation I installed a Zimo cube speaker at each end fixed in place with black mastic. Blu Tack would work too – each providing a semi-permanent adhesive.



12 The purple speaker wires from the decoder were soldered to the connections on one speaker. Additional (brown) wires were also attached to link the other speaker in parallel and in phase. I routed these wires above the locomotive PCB to avoid contact with the flywheels, cardan shafts and bogie towers.

13 I cut off a portion of the foam inside each engine room to expose the radiator fan grille and create clearance for each speaker.



14 This photograph shows the general deployment of the decoder and speakers ready for the model to be reassembled. Note the orientation of the decoder in the socket – the orange wire connection marks Pin 1 on the 8-pin plug from the decoder to allow correct alignment with the 8-pin socket.

The buffers must be removed before attempting to release the body from the chassis. Please note that these are very small parts, easily launched onto the floor during disassembly and very difficult to see when searching.

I removed the end caps from each buffer shaft with the whole model inside a large plastic bag so that any flying parts would be retained. It's not the most convenient way of working, perhaps, but a lot better than risking lost parts. There is a sprue of parts available which includes four buffer and four end cap mouldings, but not the springs, through Heljan UK via the Howes Models website at *www.howesmodels.co.uk*.

With the buffers removed and the parts stored safely away, removal of the body is effected by releasing the four tabs and sliding the body upwards. Conveniently, Heljan has provided small cut-outs in the chassis at the location of these tabs which makes identification easier. Use a flat blade to gently spread the body sides, releasing the tabs allowing the body to be removed.

FREE SPACES

The Zimo MX645R sound decoder will fit in the general area briefly described in the model's instruction leaflet at the lower cab side, avoiding the door inset. The decoder comes with a thick insulating heatshrink sleeve. I removed this since it interferes with the correct fitment of the cab moulding. I re-insulated the decoder with Kapton tape, which is effective but very thin, thus allowing the cab to fit as it should. On the more recent versions of the MX645R this sleeve is thinner than in the past, so if using a recent decoder (the sleeve is transparent rather than translucent) this step may not be necessary.

The body has an identical small free space at each end of the body. These are not large enough for typical paper cone speakers, but the Zimo 12mm x 15mm x 11mm cube speaker is a comfortable fit. I removed part of the foam lining to the engine room roof to reveal the perforated representation of the radiator fan grille. In one version, I fitted a cube speaker at each end, electrically joined in parallel to give 4Ohms' impedance.

For a second option I created a high capacitance 'stay alive' pack by joining six 2.7v 1 farad supercapacitors together in series to achieve just over 16v dielectric strength. The MX645R has on-board circuitry to manage external capacitors, including a 16v regulated power supply. These particular supercapacitors are small enough that the pack of six is only marginally longer than »

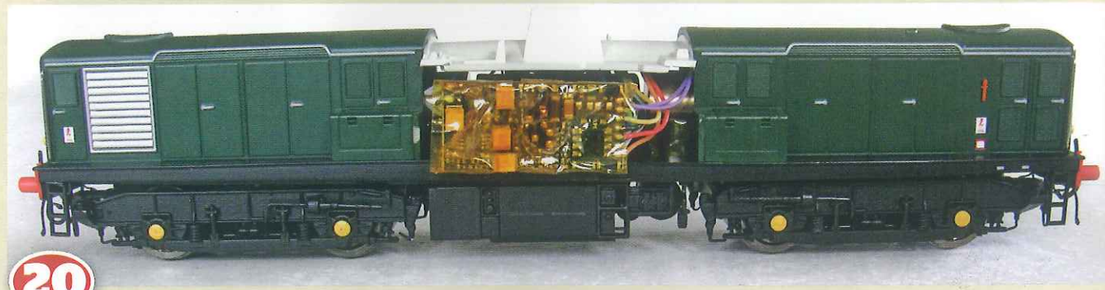
15 As an alternative to the twin speaker installation, I created a 166,666 µF capacitor pack by connecting six 2.7 volt 1F supercapacitors in series. This raises the voltage to 16.2v, perfect for the dedicated 16v regulated supply from the MX645 decoder.

16 The pack is very potent, providing several seconds of running with sound, though compact enough to fit in a nose of the Clayton if one of the two speakers is removed. Here's a comparison shot with a cube speaker.

17 The pack fits snugly in the space available, but to ensure it doesn't move around I used a little mastic to hold it in position.

18 When the body is lowered into position, the very strong magnet in the speaker attracts the three link coupling (arrowed) which prevents the body from sliding into its correct position, so take precautions to avoid this.

19 As the body is being lowered into place, feed the decoder up past the soleplate and out through the side of the model.



20 Push the body fully home, checking that no wires have been trapped, until all four fixing tabs have positively clicked into place.

the speaker, and a little lower. In my second version, therefore, I fitted a cube speaker in the nose at one end whilst at the other I installed my homemade 'stay alive' pack, connected to the dedicated wires from the decoder.

The subjective difference in sound volume between single or paired speakers did not seem very large to my ears but the increased smoothness and reliability of running with the 'stay alive' pack fitted is a very real benefit if the track is dirty, uneven or has any dead sections. As a consequence of the central motor position and the raised section required to clear the 8-pin socket the cab interior moulding contains little in the way of realistic detailing, so I elected to not fit a cab light as I felt this would highlight this deficiency.

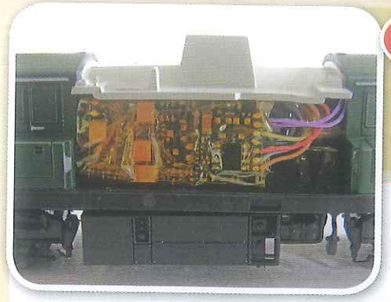
PUSH, CLICK, COMPLETE

With the decoder loosely in place, your choice of components fitted and the connecting wires fixed out of harm's way, refitting the body to the chassis is a simple push and click affair. The decoder's final position is above the solebar level, so it needs to be threaded through the cab space during the reassembly process and fitted in the appropriate space afterwards.

The cab moulding should be refitted ensuring that no wires are trapped or pinched. I found it easier to spread the lower sides a little with some gentle outwards pressure, though the fixing tabs are actually located centrally at the base of the exhausts. These engage with corresponding slots on top of each engine room.

The final task is to re-fit the buffers, which is very tricky and is when you are most likely to inadvertently flick small parts into oblivion so great care is required.

This model is transformed by the characterful sound project which was made possible with the help of Jamie Goodman of the Chinnor and Princes Risborough Railway.



21 The decoder can then be placed into the correct position, sandwiched between the cab interior moulding and the soleplate, offset to the left to avoid fouling the door inset.

Intermediate
Beginner SKILL LEVEL Advanced

TIP The sound file for the Class 17 (Cat No. ZS17A) includes a number of useful features including simulated braking on Function 2, manual power notching, manual coasting, volume control through Functions 27 and 28 and more. See *www.digitrains.co.uk* for the full list.

22 Lower the cab moulding into place and gently tease the decoder into the correct position to avoid the door inset. In this shot, the decoder needs to be moved further to the left.

23 When the decoder has been correctly positioned, push the cab moulding fully home ensuring the lower edges of the cab sides are flush with the solebar.

24 The final step is to refit the buffer assemblies. It is important to note that the shaft of each buffer has a square section to ensure correct orientation of the oval buffer head and each end cap has a single flat side which should be fitted adjacent to the chassis for proper clearance.

25 I found that access to fit the end caps was dramatically improved by temporarily removing the bogie side mouldings. Here one side is fitted and the other removed, illustrating the two push fit fixings on each side. This completes reassembly of the locomotive ready for it to return to service.

WHAT WE USED

Product	Supplier	Price
Zimo MX645R sound decoder	*www.digitrains.co.uk*	£95.00
Zimo 11mm x 15mm x 11mm cube speaker	*www.digitrains.co.uk*	£9.00
6 x 2.7v 1farad supercapacitors	*www.digitrains.co.uk*	£6.00

THE SURVIVOR

● **The sole surviving Class 17 D8568 is kept and maintained at the Chinnor and Princes Risborough Railway, but makes occasional forays to other preserved lines. *Visit www.chinnorrailway.co.uk* to find out more about the railway and D8568.**