'Western' ambassadors for sound

The distinctive note of the 'Western' hydraulics is highly sought after in model form. PAUL CHETTER installs sound into Heljan and Dapol 'OO' Class 52s and compares the steps required and the results achieved.

THE DESIGN of ready-to-run model locomotives has until recently been aimed at producing reliably engineered chassis clothed with convincing bodies. In the last few years, Digital Command Control (DCC) sound has become an increasingly important aspect of the hobby. Modellers who fit sound to their models often find that these design considerations are the biggest problem to be overcome for a successful installation.

It makes life much easier if the manufacturer has made provision for a DCC sound decoder and speaker - though it is usually still possible to create a workable solution in models where no provision has been made too.

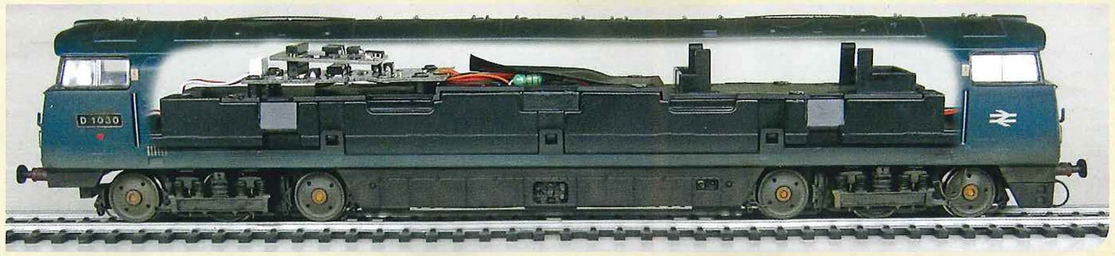
The Heljan model is an older design which does not especially cater for DCC sound, whilst the more recently designed Dapol version has fully embraced the need to make suitable provision. Can the same components be deployed in each version? The Dapol model is designed to accept a specific speaker from the DCC Supplies range. I could see that this would also fit, somewhat differently, in the Heljan model so I decided to use the same type of speaker in each.

Dapol's decoder interface is a 21-pin connector so I selected a Zimo MX644D for this model. To suit the 8-pin socket in the Heljan I used a Zimo MX645R with an 8-pin harness. Apart from the interface type, there is a very close similarity between these two decoders. Any difference in sound performance will therefore be as a result of the speaker location alone.

Dapol provides very clear installation instructions. If you follow these carefully, you will not need to modify your model in any way so your warranty should not be affected if you decide to install sound. The Heljan 'Western' does not have sound fitting instructions provided. Installing DCC sound in the way I describe below requires a single hole to be drilled through the chassis and a section of the fuel tank assembly to be cut away. Modifying the model in this way may invalidate your warranty.

STEP BY STEP INSTALLING DCC SOUND IN DAPOL AND HELJAN 'OO' 'WESTERNS'

Skill level: Beginner – Intermediate – Advanced



1 As this cutaway shows the Dapol Class 52 has been designed with digital sound in mind from the outset. Note the space with vertical clips for the speaker to the right and the 21-pin decoder socket to the left.

WHAT WE USED

PRODUCT	SUPPLIER	PRICE
Zimo MX645R sound decoder	www.digitrains.co.uk	£85.00
Zimo MX644D sound decoder	www.digitrains.co.uk	£83.00
Bass reflex speaker	www.dccsupplies.com	£8.16

DAPOL'S 'WESTERN'

There are four screws holding the body and chassis securely together. These are in the chassis close to the leading edge of each bogie. When these are removed, the bodyshell can be lifted from the chassis in a vertical motion.

The wiring for the cab lights is fitted to the inside of the roof and connected to the circuit board with a four-gang connector. It is possible to complete this installation with this still connected and the bodyshell laid alongside the chassis, but I unclipped the plug and put the body to one side for safety. The main Printed Circuit Board (PCB) is at one end of the chassis and speaker provision at the other, below one pair of perforated etched fan grilles in the roof.

This provision consists of a flat platform with four vertical tabs designed to hold the specified speaker firmly in place. The system works very well in holding the speaker in the required location and is a simple 'no tools required' solution that would be welcome in other models. The internal positioning protects the speaker from accidental damage.

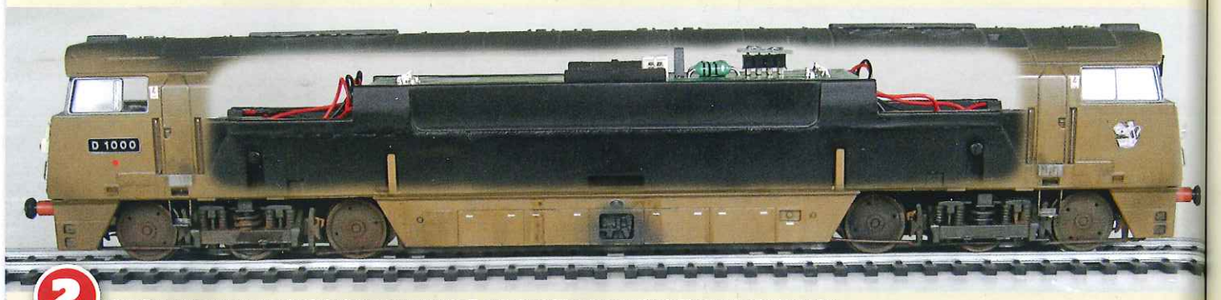
There are two clearly marked solder pads on the PCB to which the speaker wires should be attached. I found on this example that I needed to clean these pads before soldering wires to them. The only other task was to remove the blanking plate and replace it with the MX644D. My photograph and the Dapol instruction sheet show the correct orientation of the decoder. A quick test showed everything to be in order so I refitted the cab light wiring connector and slipped the body back onto the chassis, securing it with the four retaining screws.

Full marks to Dapol - this is a well designed and executed solution easily within the capability of most modellers. »

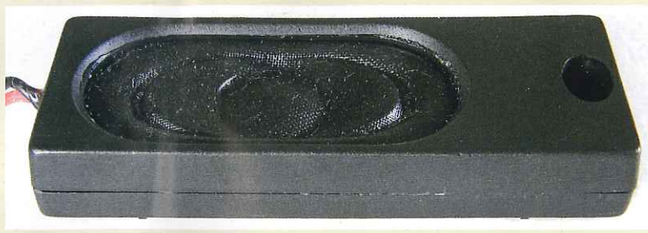
The Dapol (left) and Heljan (right) 'Westerns' are from two distinct eras in model manufacture with the Dapol model entering the market after the widespread adoption of digital sound fitting. Both are straightforward projects to install sound into, although the Heljan model requires the most work.

STEP BY STEP **INSTALLING DCC SOUND IN DAPOL AND HELJAN 'OO' 'WESTERNS'**

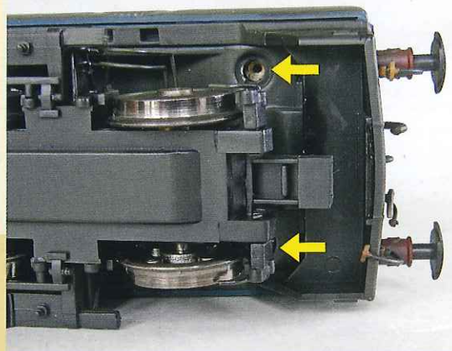
Intermediate
Beginner SKILL LEVEL Advanced



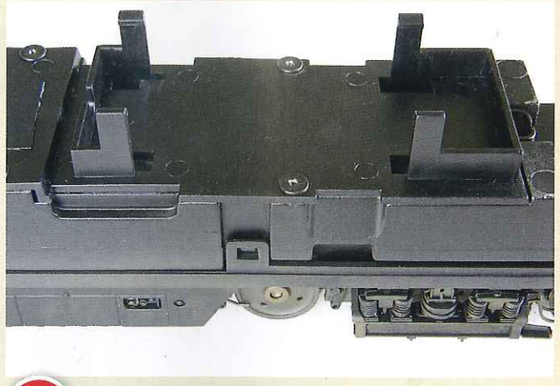
2 The Heljan model offers less space inside for digital sound, but it is still perfectly possible, we just need to decide on a space for the speaker.



3 Here's the bass reflex speaker, one of which will be fitted to each model. It measures 58mm x 22mm x 9.3mm and comes pre-fitted into a sealed enclosure.

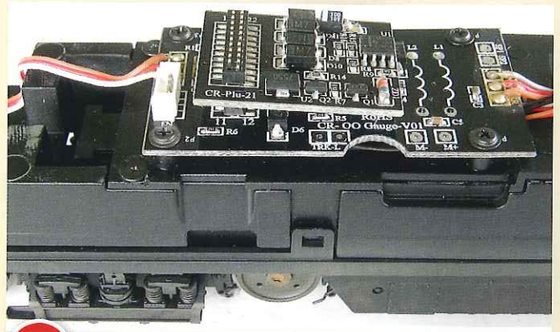


4 We will start with the Dapol Class 52. To release the body from the chassis remove the retaining screws fitted here (arrowed) plus those in a similar position at the other end. The body will then slide upwards but beware of the cab lighting which is joined to the main Printed Circuit Board (PCB) by a 4-pin connector.

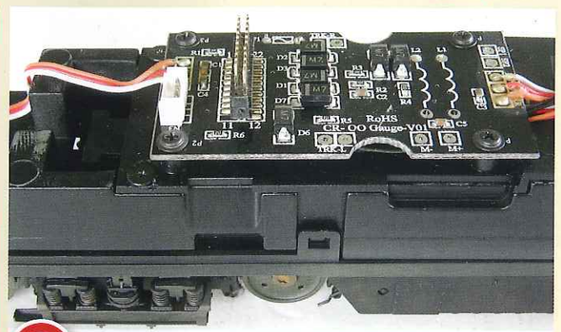


5 The speaker location is optimised for the 58mm bass reflex speaker shown above. A flat area with four side lugs ensures correct fitment and good hold.

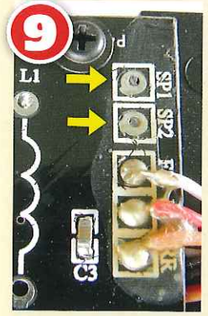
6 Consequently, fitting the speaker is a breeze. As it is a simple push-fit, no tools are required for this step.



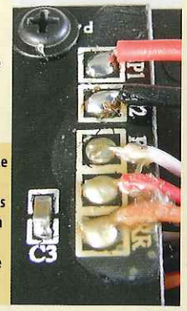
7 Towards the other end of the chassis is the main PCB. The blanking plate, allowing operation on DC without a decoder fitted, is shown here still in situ.



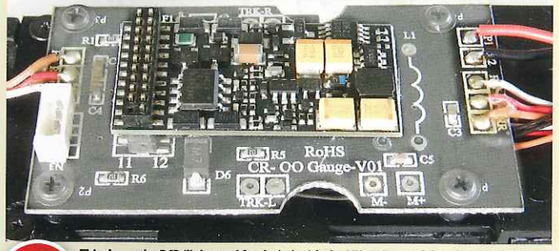
8 The PCB features clear labelling including sufficient pin numbers to ensure correct decoder fitting. This is a useful supplement to the Index Pin on the 21-pin connector.



9 The speaker wires must be connected to the PCB. The solder pads provided (arrowed) are easily accessible and clearly labelled. Note the insulating coating.



10 After cleaning the pads I soldered the speaker wires in place ensuring that both connections were clean and fully isolated from one another.



11 This shows the PCB (lightened for clarity) with the MX644D sound decoder fitted. The white connector shown on the left of this picture is the connector for the cab lighting. I reconnected the wiring plug and refitted the body to complete the installation.

12 To begin work on the Heljan model remove the body by gently prising open the lower body sides to release the locating tabs, allowing it to be lifted vertically upwards. No connecting wires in this case. The Spartan looking PCB is revealed. Note the rubber clips on each side which hold it in place.

HELJAN'S CLASS 52

The Heljan model is of an older design generation. The body is removed by gently prising out the lower body edges to release the locating lugs and then sliding it vertically from the chassis. There are no cab lights fitted as standard so there is no wiring to be careful of.

The motor is held in place by a rubber moulding which fits firmly in a central compartment of the chassis. The top edges of this moulding also serve to hold the PCB in place above the motor. Peeling this back on one side releases the PCB.

The track pick-up and locomotive lighting wires connect to each end of the PCB via a series of 2-pin connectors. I removed these from one end along with the motor wire connector halfway along the PCB in order to gain access to the lower part of the chassis. If you do this, make a note of the respective positions of the connectors as they look similar and the wiring is not fully colour coded.

To provide a safe path for the speaker wires to pass to the chosen speaker location in the fuel tank moulding I drilled a 2mm hole through the chassis. This will ensure that the wires do not foul the bogie. Any metal swarf must be meticulously cleaned away to avoid potential damage.

I replaced the edge connectors, motor wiring and refitted the PCB. Then I removed the small blanking plate from the 8-pin socket and plugged in the decoder. Making sure that no wires could short, I tested the direction of travel as there is no indication of the correct plug orientation shown on the PCB or socket. The plug is shown in the correct position in the guide below.

The fuel tank moulding can be removed by releasing the four lugs holding it in place. It is revealed as a three part assembly held together by small hole and dowel joints. I separated these parts and scribed the length of the speaker onto the centre section, roughly equidistant from each end. I cut out the central section with a junior hacksaw, refitting the end sections which I glued in place for rigidity. The lower inside edges of the side pieces required a small amount of filing to create space for the speaker to fit with the cone flush with the lower surface of the tanks.

I drilled a hole for the speaker wires to emerge and fed them through this and the hole previously drilled in the chassis. I secured the speaker to the tank moulding internally with mastic: there's no need to seal the speaker to the tanks as it is a self contained unit.

Some additional care is required when handling models with speakers mounted in this way as vulnerable parts are not fully protected. The speaker magnet will attract any small loose ferrous material in the vicinity, so regular cleaning of a layout is recommended.

The tanks were refitted to the chassis and the speaker wires soldered to the purple wires from the decoder, the joints being insulated with heatshrink tubing.

The MX645 is equipped with circuitry to manage 'stay alive' capacitors, and there is sufficient free space available to fit six supercapacitors wired in series below the roof immediately behind either of the cab bulkheads. I fixed them in place with some mastic, soldered the grey wire to the negative and blue wire to the positive leads of the 'stay alive' pack. The installation was completed by refitting the body to the chassis.

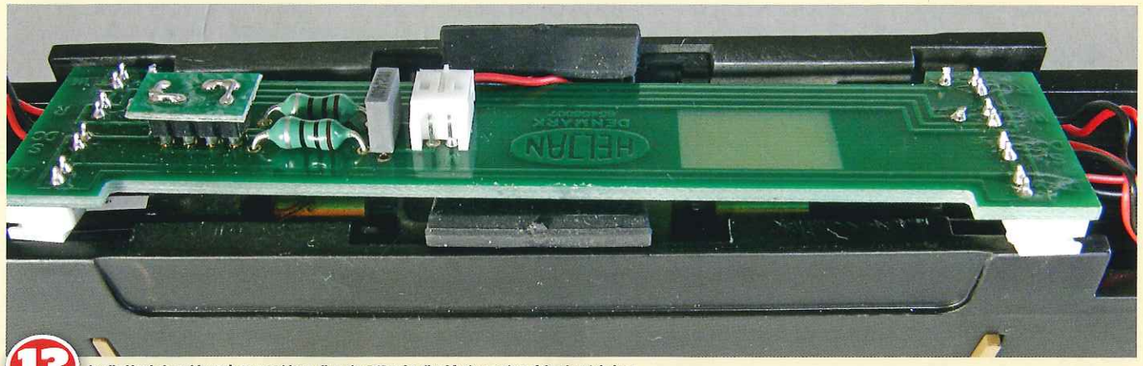
THE VERDICT

The manufacturers' approaches to provision for DCC sound installation are poles apart. Heljan is perhaps handicapped by being earlier to bring its model to market whilst Dapol is advantaged by new thinking in this area. The Dapol Class 52 is a clear winner in the convenience and consistency of results that are possible and shows how forward thinking in the design process is making our life easier when it comes to adding digital sound.

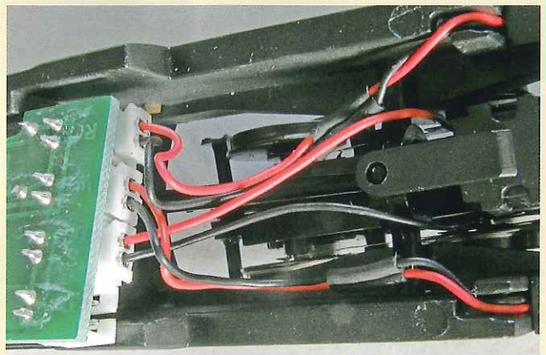
The Heljan Class 52 is not designed for sound fitment. It is nevertheless a fairly straightforward model to adapt but will require a few more modelling skills in order to achieve the finished results shown here.

Real 'Westerns' are large and spacious, as are these models. It is possible to fit the same type of speaker to each of them, either by design or good fortune. I think the benefit of designing for DCC sound installation from the outset has the potential to be even greater in the smaller main line locomotives and shunters. Fortunately, we are already seeing some movement towards this and I believe fully integrated models are just over the horizon.

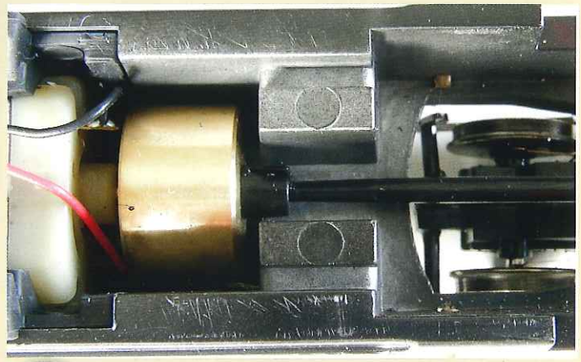
STEP BY STEP INSTALLING DCC SOUND IN DAPOL AND HELJAN 'OO' 'WESTERNS'



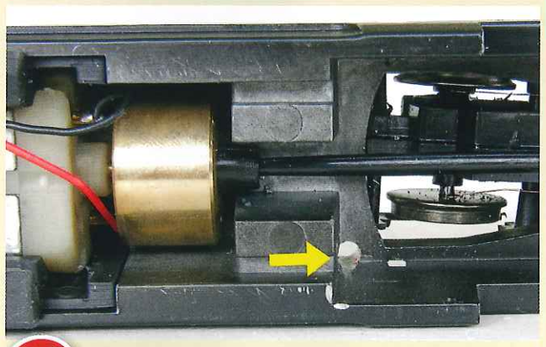
13 I pulled back the rubber tab on one side to allow the PCB to be tilted for inspection of the chassis below.



14 A series of 2-pin connectors link the lights and track pick-up wires to the PCB. They are not individually colour coded, so make a note or take a photograph of the respective positions. I removed these plugs and the one connected to the motor below to allow the PCB to be lifted out of the way.

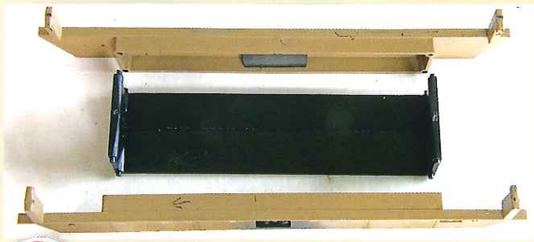


15 I sought a suitable position to drill through the chassis which would not compromise structural integrity.

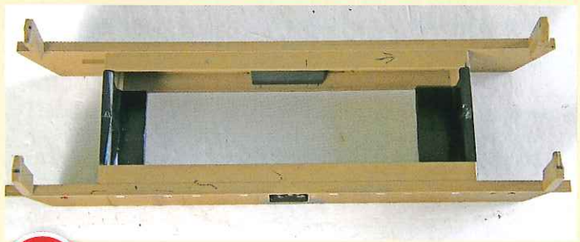


16 I drilled a 2mm hole (arrowed) to allow the speaker wires to pass from below the soleplate to the interior in a route which will prevent the bogie fouling on the wires.

17 The chosen location for the speaker in this project is the fuel tank. The assembly is removed by releasing the four extended tabs which hold it in place.



18 This can be separated into three separate moulded parts. By pulling them apart gently the tiny dowel pegs at the ends will be undamaged.



19 After careful measurements a portion of the central moulding was removed, the remaining parts were reassembled and glued using liquid solvent glue for rigidity and security.

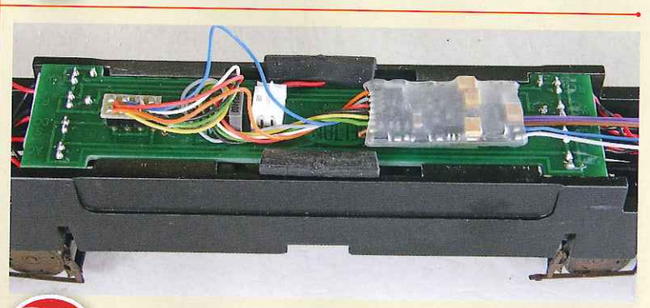
Intermediate
Beginner SKILL LEVEL Advanced

20 When fully set the two lower inside edges were lightly filed to create enough width for the speaker to fit snugly.

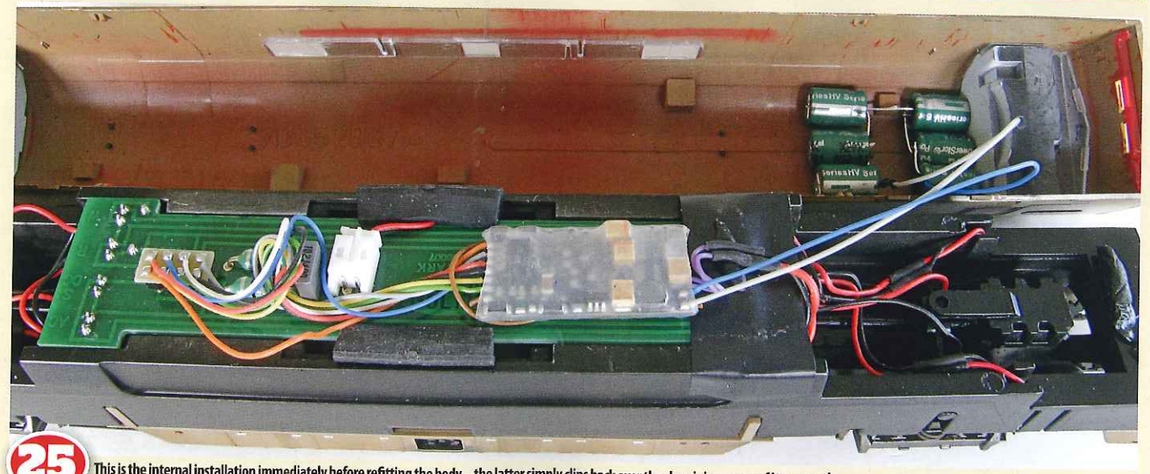
21 A hole had been prepared in the appropriate end of the fuel tank for the speaker wires to pass through.

22 With the speaker fitted and fixed to the tank internally with mastic I refitted the fuel tank assembly and fed the speaker wires through the chassis using the hole drilled in step 16 to the interior.

23 During the survey for speaker location I noted that there is free space behind each cab's rear bulkhead. As the MX645 decoder has provision to manage external 'stay alive' capacitors I wired six 2.7v 1F supercapacitors in series and fixed them to the inside of the roof. The blue and grey capacitor wires from the decoder were soldered on to the positive and negative leads respectively and insulated.



24 The 8-pin plug was pushed into the DCC socket and the decoder fastened to a flat area of the PCB. Note the orientation of the plug as the position of pin No. 1 is not indicated on the socket or PCB.



25 This is the internal installation immediately before refitting the body – the latter simply clips back over the chassis in reverse of its removal.