Wired for sound

The recently released Hatton's 'OO' gauge GWR 0-4-2T is a modern design which makes provision for digital sound. **PAUL CHETTER** explains how he tackled this tiny locomotive.

Hatton's new GWR 0-4-2T for 'OO' gauge was released at the beginning of 2017 and offers an impressive level of detailing together with preparation for digital and sound installations. It is available in '14XX', '48XX' and '58XX' varieties all of which have the same internal layout. The step by step guide explains how we went about installing a Zimo decoder and speaker in this compact model.

SMALL TANK ENGINES with just four driving wheels require as much mass as possible to optimise traction and electrical pick-up continuity. This means that what might otherwise be empty space is often filled with metal. With this in mind, it is reassuring to learn that the designer has provided for conversion to Digital Command Control (DCC) or DCC sound with the recently released Hatton's GWR '14XX', '48XX' and '58XX' series 0-4-2Ts (HM116).

Although this installation does not require irreversible modifications to the body or chassis, there are some rearrangements of the internal electrics including soldering wires to a decoder. Please read the step by step guide completely before deciding to undertake such an installation. Your warranty may be adversely affected, and there may be other ways to install the decoder and speaker.

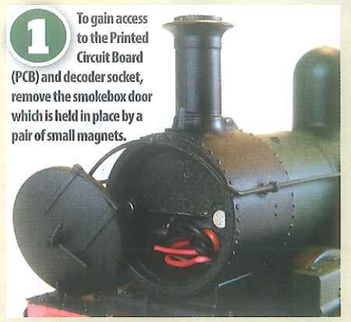
INSPECTION

Our first port of call, as always, is an assessment of the internal spaces and their potential. There is space within the smokebox and boiler accommodating a small printed circuit board (PCB) with a 6-pin DCC socket, blanking plug and associated wiring harness. These must be teased out of the model carefully in order to fit a small format decoder to the socket before this assembly and the wiring are pushed back inside. On this example, the insulation on one of the motor wires was damaged to the extent that bare wires were visible. However this occurred, it was probably due to how tightly these components had been pushed into the model. There is a generous length of harness provided, so a repair was easily made but it was a timely reminder to check the condition of all installed wiring as far as reasonably possible.

The ballast weight fitted to the smokebox and boiler is necessarily large, restricting the available height. The length of the space is »

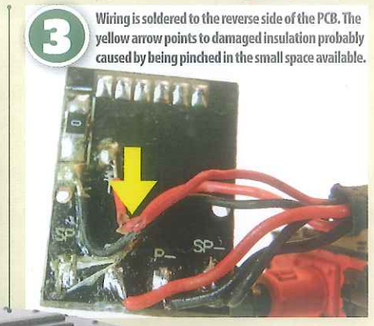
STEP BY STEP **INSTALLING DCC SOUND IN HATTON'S GWR '48XX' 0-4-2T**

Beginner — Intermediate — Advanced — SKILL LEVEL



1 To gain access to the Printed Circuit Board (PCB) and decoder socket, remove the smokebox door which is held in place by a pair of small magnets.

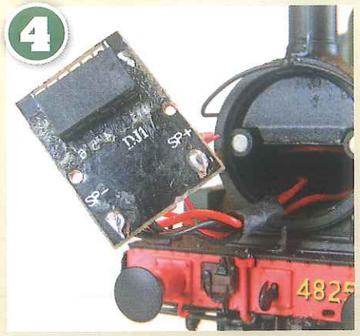
2 I used forceps to gently tease the wiring and PCB from inside the smokebox. Seen here is the PCB with a blanking plug fitted.



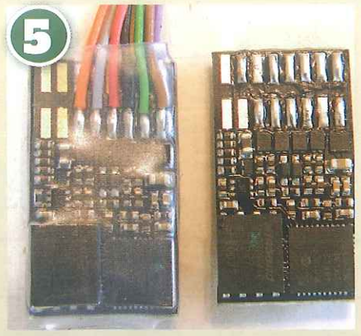
3 Wiring is soldered to the reverse side of the PCB. The yellow arrow points to damaged insulation probably caused by being pinched in the small space available.

WHAT WE USED		
Product	**Supplier**	**Price**
Hatton's GWR '48XX' 0-4-2T	*www.hattons.co.uk*	£87.99
Zimo MX648R sound decoder	*www.digitrains.co.uk*	£99.00
Zimo 10 x 15 x 8mm cube speaker	*www.digitrains.co.uk*	£9.00

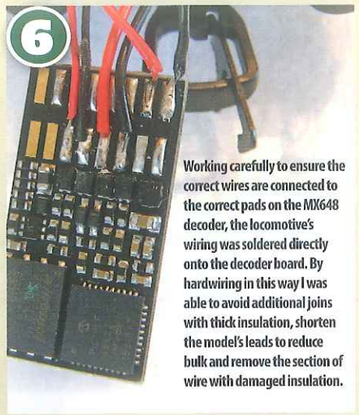
Intermediate
Beginner SKILL LEVEL Advanced



4 With the blanking plug removed, the 6-pin DCC socket and the speaker wire terminals can be clearly seen. Zimo's MX649 decoder was tried next, but wouldn't fit in the space available below the smokebox weight so we changed tack.

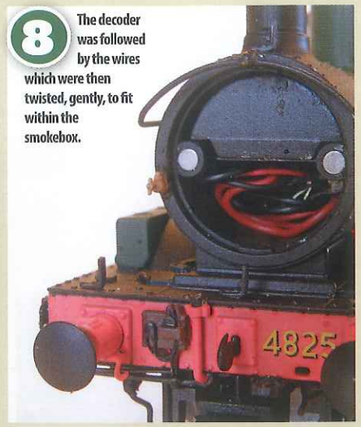


5 Zimo's MX648 is 10.5mm wide and just 20mm long. There is sufficient width in the smokebox to accept this comfortably, so I judged this to be the most easily accommodated format in this instance. I removed the insulating sleeve and all the wires from the decoder.



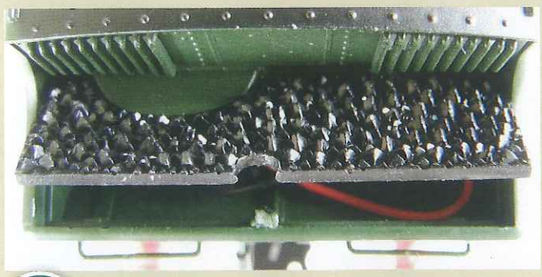
6 Working carefully to ensure the correct wires are connected to the correct pads on the MX648 decoder, the locomotive's wiring was soldered directly onto the decoder board. By hardwiring in this way I was able to avoid additional joins with thick insulation, shorten the model's leads to reduce bulk and remove the section of wire with damaged insulation.

7 Having completely wrapped it in Kapton tape for insulation, the decoder was fed into the smokebox, then pushed gently deeper into the boiler.

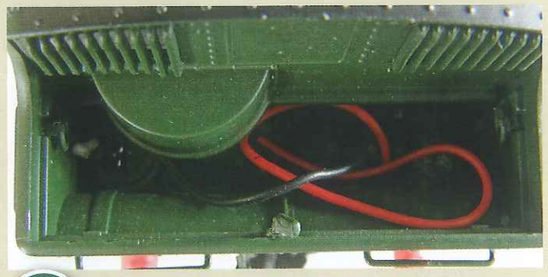


8 The decoder was followed by the wires which were then twisted, gently, to fit within the smokebox.

9 Using the reference cut-out at the bottom to correctly position it, the smokebox door was refitted to be held securely by the magnets completing installation of the decoder at this end of the locomotive. Now we can move on to fitting a speaker.



10 The rear of the dummy coal load can be raised by inserting a small screw driver or cocktail stick into the upper lamp iron clearance cutout.



11 With the coal load removed the speaker wires can be observed tucked into the bottom of the bunker.

around 27mm, theoretically long enough to accommodate a micro sized sound decoder. Unfortunately, although a very small DCC decoder would probably fit in this way, the bulk of the wiring and PCB make this all but impossible for any sound decoder. I attempted to fit one of Zimo's even smaller sub-micro decoders, the 'longer but narrower' MX649 and the 'shorter but broader' MX648 using the existing wiring and PCB but the sheer bulk was too great.

To get around this and free up some valuable space I removed the heatshrink insulation and all the wires from an MX648 decoder. After carefully noting the connections to the PCB, I removed them one wire at a time and after shortening to reduce bulk, soldered each directly to the appropriate pad on the decoder. I used Kapton tape to insulate the decoder and gently eased the decoder and wiring back inside the model before refitting the smokebox door saving a substantial amount of space and making the sound decoder a comfortable fit inside the 0-4-2Ts boiler.

SPEAKER SELECTION

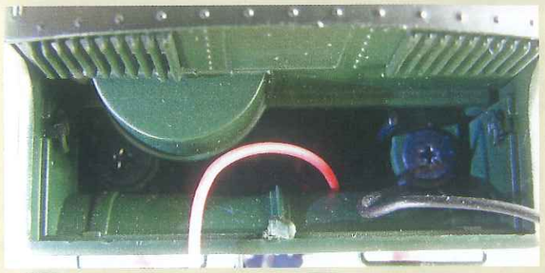
Provision has been made to fit a 10mm x 15mm flat speaker inside the coal bunker at the rear of the locomotive and crucially, a pair of speaker wires runs from the smokebox to the bunker. These alone make this installation much simpler as there is no need to find complex routes for wires – that is all done for you. I inserted a very small flat bladed screwdriver into the lamp iron clearance slot in the dummy coal load and levered the latter upwards at the rear before removing it to reveal the speaker wires and location provision.

I was unable to fit a speaker with the cab roof in place as there is insufficient room to manoeuvre it into position. Consequently, I lifted the cab off by removing the two fixing screws inside the bunker. The cab moulding consists of the front, roof, and rear panels which must be lifted vertically as one piece - the cab sides are part of the main body moulding. Note that there is a small lip on the centre section of the front panel. I found it easier to release this with a little rearward pressure on this section before removing the cab. With the cab removed there is good access to fit a crew if you wish. It is also possible to slide upwards and remove the lower portion of the rear bulkhead.

It's important to note for successful reassembly the way in which the opening cab doors are fitted. Each has a small pivot at the top and bottom of the rear edge which engages with a hole at the bottom and a retaining clip at the top formed when the lower rear cab bulkhead is refitted. The black plastic moulding intended to locate the speaker is now clearly visible and can be removed by lifting vertically. The complex shape of this moulding shows that thought has been given to locating the speaker and its orientation, although without a firm method of holding it in place.

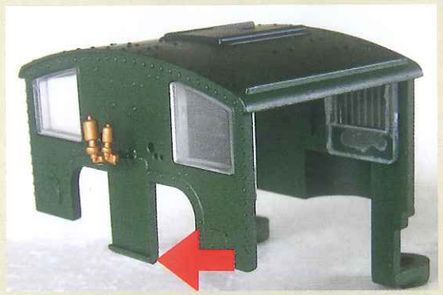
The moulding doesn't provide proper separation of sound from the front of the speaker from that at the rear, so I decided to dispense with it, releasing an extra couple of millimetres clearance in the bunker. This allows the use of a speaker with enclosure for better sound output. To allow clearance for the handbrake shaft, a small portion of the enclosure must be removed, but when made good this has no discernable detrimental impact on the sound. Reassemble in the reverse order.

Whilst the installation was a little more complicated than it first appeared, the final result is very satisfying as it has brought a fine model of this attractive Great Western Railway prototype to life.



12 I moved these wires out of the way to reveal the two screws fixing the cab roof in place. These must be removed to gain access to the cab interior and for clear access to the speaker wires.

13 The front, roof and rear panels which form the cab can be removed as a single unit by sliding upwards once the screws have been removed.



14 There is a small lip (arrowed) at the foot of the centre section of the cab front panel. I found it easier to release the cab moulding by exerting a gentle rearward pressure on the centre of the cab front to disengage this lip before sliding the cab moulding upwards.

15 Removal of the cab reveals the interior plus the lower rear cab bulkhead and the moulding to locate the speaker.

16 The cab features doors which can be positioned open or closed. In order to facilitate reassembly, note the way in which the door pivots (upper one arrowed in red), and are engaged with holes in the cab floor and the ends of the lower cab bulkhead (arrowed in yellow).

17 The lower cab rear bulkhead (arrowed in red) is normally held in position by the cab moulding so no additional fixing is required. It can therefore be lifted clear, in turn releasing the speaker locating moulding (arrowed in yellow).

18 It will be more convenient to fit the speaker to this moulding if it is removed from the model. This complex moulding is designed to locate a 10mm x 15mm speaker centrally to avoid contact with the fixing towers each side of the bunker.

19 This shows a speaker in the correct orientation but also reveals the lack of any retaining mechanism. It will need to be glued in place if it is to be retained firmly in position.