OO Works *a treat!*

Can you install DCC and sound into a model with a brass chassis and cast metal body components? OO Works 'C13' 4-4-2T – a model not designed for this sort of DCC fitment at all – and shows how straightforward it can be.

PAUL CHETTER describes how he fitted sound to an

WHAT WE USED		
Product	**Supplier**	**Price**
OO Works 'C13'	*www.ooworks.co.uk*	£205.00
Zimo MX648 sound decoder	*www.digitrains.co.uk*	£90.00
Zimo 10mm x 15mm x 12mm speaker	*www.digitrains.co.uk*	£7.00

ONE OF THE WAYS in which a small manufacturer can reduce costs is to use materials which may not be viable in mainstream volume production, but which require less investment in complex machinery.

OO Works has used a brass chassis, a cast metal footplate and cleverly designed two piece body cast in resin in its Great Central Railway 'C13' 4-4-2T – a model which first arrived on the scene in April 2013 (HM71). This choice of materials produced some interesting considerations when designing the DCC sound installation, mainly due to the restricted free space available resulting from the thickness of the cast material.

Regular readers will know of my preference for any solution which avoids any externally visible signs of the installation. Once again, the Zimo MX648 sound decoder and miniature speaker combination made the seemingly impossible into a fairly straightforward proposition. The impressively tiny dimensions of these two components make them amongst the smallest decoder and speaker combination currently available.

COMPACT DESIGN

The motor in the 'C13' is very compact and does not have a flywheel. However, the model has track pick ups from all four driving wheels and all four wheels on the leading bogie. This gives reliable power collection and reduces the need to fit 'stay alive' capacitors, fortunate in such a space challenged design.

The prototypical space below the boiler would clearly introduce some reduction in usable space within the model. My initial thoughts of a boiler mounted decoder and coal bunker enclosed speaker were quickly dashed when I removed the body. The way the boiler and smokebox had been cast restricted the space available even further than I had imagined. The bunker also disappointed with its total lack of space. The entire bunker was filled with cast material, preventing any type of speaker being located here, although this naturally contributes in additional adhesive weight meaning this is a strong tank engine on the track.

Zimo makes three versions of its 'sugar cube' type speakers - a sub-miniature 8mm x 12mm x 8mm, miniature 10mm x 15mm x 12mm and a lower profile 10mm x 15mm x 9mm. The largest of these will fit snugly within the boiler barrel.

There is a small clear space between the motor and the internal face of the firebox moulding, but of restricted height and width, the latter critical to allow free movement of the rear driving wheels. The MX648 would fit into this space, with the added bonus that the decoder wires could be connected directly to the motor and track pick-ups without any joints being required. Their short runs would also help to create a compact and tidy installation. To assist in this, I removed all other wires from the decoder, except those required for the speaker.

Handbuilt and kit built models are often seen as difficult sound installations, but with care and consideration it is possible to install DCC and sound into the majority of brass and cast metal locomotives. This is the OO Works Robinson 'C13' 4-4-2T which features a brass chassis, die-cast running plate and resin superstructure.

DISMANTLING

Though not absolutely necessary, I decided to remove the motor assembly from the footplate casting to make it easier to access the connections for de-soldering and soldering. This required the removal of the rear pony truck to gain access to the screw retaining the rear end of the motor assembly. I removed this and the one holding the front to allow full separation.

The exposed connections for the track pick ups made it convenient to remove them and replace with the correct wires from the decoder – black and red. Similarly, simple wiring at the motor enabled me to replace them with the orange and grey motor wires from the decoder.

A small blob of Blu Tack or similar can be used to fix the decoder in place within the footprint of the firebox moulding. Before moving on, I gave the chassis a short run on my test track to confirm everything was working correctly.

I then refitted the main body, ensuring that the free lower ends of the vertical handrails attached to each tank were correctly slotted into their respective holes in the footplate before tightening the eight retaining screws.

I cut the purple speaker wires to the correct length to ensure when the model was fully reassembled they would not make contact with the exposed portion of the gearbox. The partly penetrating action of the boiler location flange would push the speaker further into the boiler and gently tension the speaker wires to keep them from harm's way. Nevertheless, I used a small blob of Blu Tack to hold the wires to the inside top of the boiler just to make sure.

I slid the boiler assembly backwards, taking care to correctly locate the handrails into the holes provided in the water tank front panels and secured it in place with the single longer screw removed earlier.

CUSTOM SOUNDS

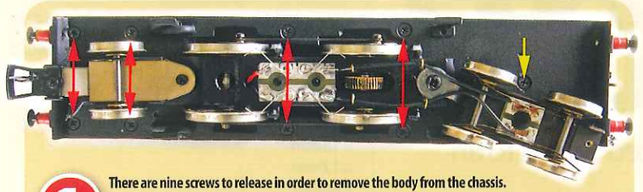
The final task was to load a custom sound project that I have compiled for this model. This has been based on the sound files I produced for the Thompson 'L1' 2-6-4T/Gresley 'N2' 0-6-2T which have similar proportions to the 'C13' 4-4-2T. The 'L1'/'N2' sound file is available from Digitrains to load onto your choice of Zimo decoder too if you wish to go down this route.

The end result is an unusual and attractive sound fitted model which few will expect to hear making any noise at exhibitions. Look out for it on a *Hornby Magazine* exhibition layout soon… HM

GO ONLINE...
WWW.HORNBYMAGAZINE.COM
TO SEE AND HEAR THE OO
WORKS 'C13' 4-4-2T IN ACTION.

STEP BY STEP

STEP BY STEP **INSTALLING DCC SOUND IN AN OO WORKS 'C13'**



1 There are nine screws to release in order to remove the body from the chassis. Eight identical screws, arrowed in red, fix the main body whilst a single, longer, screw retains the front end, arrowed in yellow.

2 The cast resin body has been designed in two parts. The boiler and smokebox section separates from the main body immediately adjacent to a boiler strap band which pretty well disguises the join when assembled.

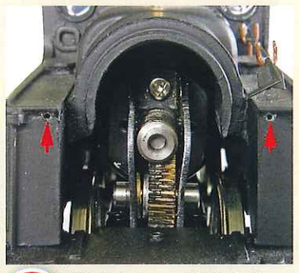
3 With the retaining screw removed I slid the boiler forwards to disengage its rear location with the main body, taking care not to distort the handrails, then lifted the front end to clear the vacuum pipe fittings.

4 Note the flange on the boiler top used to locate the front assembly and form a light-proof joint, the thickness of the boiler walls and the depth of free space available within the boiler and smokebox.

5 It is fortunate that a smoke generator was not specified for this installation as it would require a lot of alteration to the resin casting. You can see that the internal space is restricted, dashing any hope of installing the decoder here.

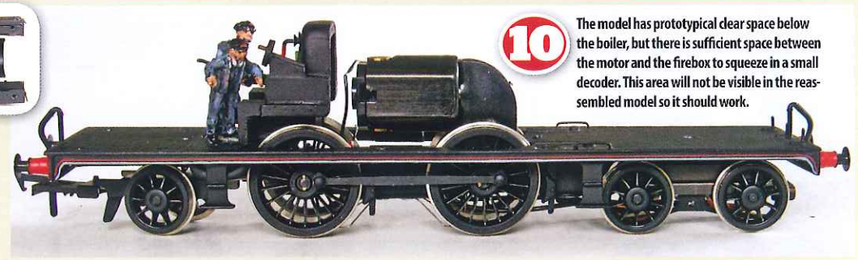
6 Although tempted to drill out the chimney for sound to escape, careful measuring showed that it would not break out into free space inside the smokebox, which is almost entirely filled with cast resin. Note the 'free' ends of the handrails.

7 There is just enough room to fit the largest of the three sizes of Zimo 'sugar cube' speakers, 10mm x 15mm x 12mm. This requires only a pair of speaker wires to be connected to be fully operational as it is otherwise completely self-contained. The cut-out in the lower boiler for the gearbox will be adequate to allow the sound to escape.

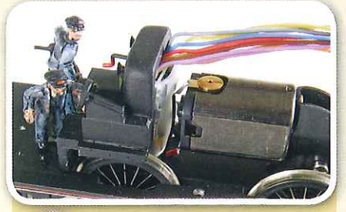


8 Note the holes, arrowed, in the top front of each water tank which locate the rear of the boiler handrails during reassembly.

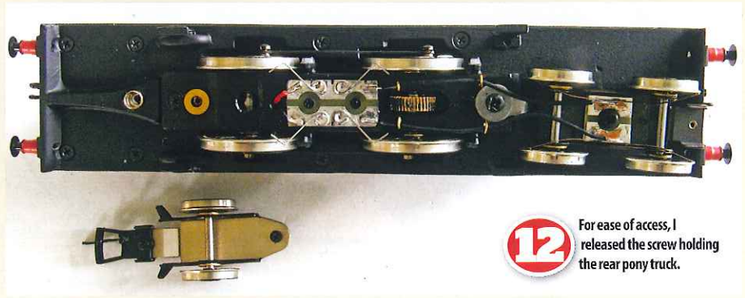
9 The main body lifts clear when its retaining screws have been removed. The coal bunker of tank locomotives normally provides enough space to fit a speaker or decoder or both. In this instance all the space is filled with cast material.



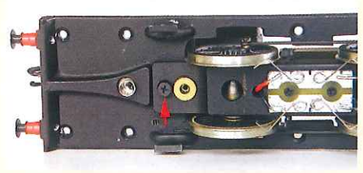
10 The model has prototypical clear space below the boiler, but there is sufficient space between the motor and the firebox to squeeze in a small decoder. This area will not be visible in the reassembled model so it should work.



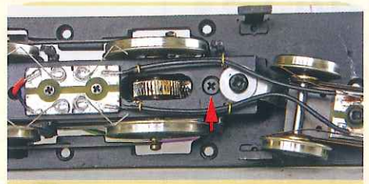
11 This shot of a test fitting shows the wires connecting the track pick ups to the motor, black to the top terminal and, just visible, red to the bottom.



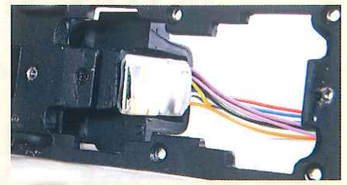
12 For ease of access, I released the screw holding the rear pony truck.



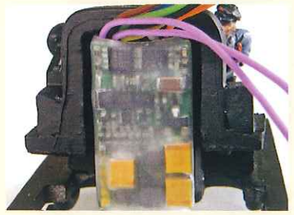
13 This reveals a screw, arrowed, which holds the rear of the motor/gearbox/driving wheel assembly.



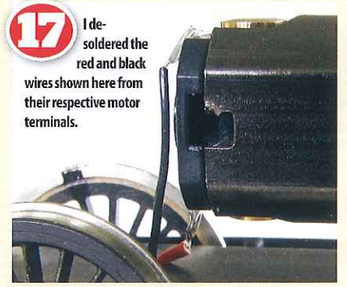
14 Releasing the screw, arrowed, retaining the front of the assembly allows it to be separated from the footplate casting.



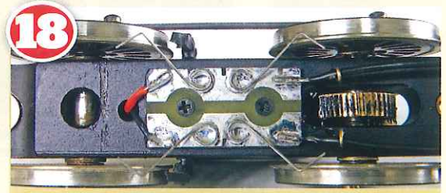
15 With the motor assembly removed it is possible to see how the MX648 will fit within the firebox moulding.



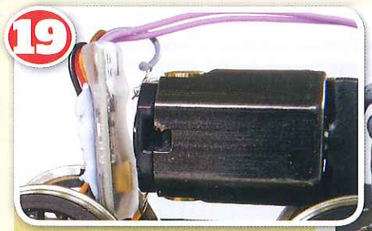
16 The shoulders of the moulding (and a little Blu Tack) will prevent the decoder from touching the driving wheels.



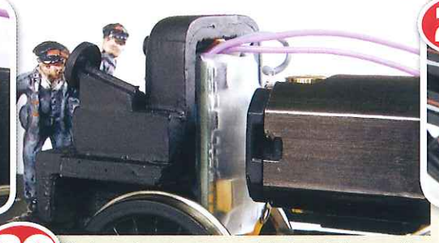
17 I de-soldered the red and black wires shown here from their respective motor terminals.



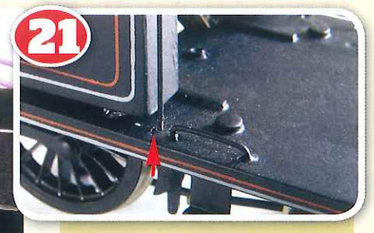
18 These wires pass through the chassis and are connected to the track pick ups. I de-soldered these and discarded the removed wires. I attached in their place the same coloured wires from the decoder, cut to the correct length to avoid any slack.



19 The grey motor wire was shortened and connected to the top motor terminal whilst the orange wire was similarly modified and soldered to the bottom one.



20 The two purple speaker wires were retained and all other spare wires cut off close to the decoder. Their insulation and the non-conductive surrounding material will ensure no shorting of these will occur. This helps to provide a neat and compact installation, typically required in small spaces.



21 When reassembling the main body to the footplate casting it is essential to fit the tank handrails into their respective holes in the footplate, shown here arrowed. Refit the retaining screws.

22 The speaker wires were shortened to the correct length and soldered to the speaker terminals. I used some Blu Tack to hold the wires to the top of the boiler, out of the way of the exposed gears.

Slide the boiler and smokebox rearwards, ensuring the handrails locate correctly. The flange locator will push the speaker further into the boiler casting and put a little tension into the speaker wires, holding them safely in place.

23

24 When fully assembled there is no visible sign of the sound installation, though there is plenty of audible evidence produced. I loaded a custom sound project that I created for this model to complete the transformation.