Class 108 DMU with DCC Sound

Thank you for your choice of the Graham Farish Class 108 DMU with DCC sound. Engine noise, randomised sounds and lights also operate on DC. Please spend a few moments to read these notes which have been produced so that you may obtain the maximum satisfaction from your model. There are some unique control features which require a little explanation.

Shipped default address 3.

Ideally set the controller to 128 speedsteps if it is a feature on your DCC equipment

To change address: write a new address using a programming track or main track (short address only) according to the features of your DCC equipment.
Note: this DMU should be removed from the track when writing an address to another decoder if using Bachmann EZ Command Control Centre

Reset - write a value of 8 to CV 8 (the decoder retains sound and project values).

For full details of the decoders please refer to information sheets on Zimo MX646N (power car) and MX681N (trailer car) also available from www.bachmann.co.uk

Standard Driving Scheme Operational Tips

Your Graham Farish model will produce a wide range of typical sounds from a Class 108 DMU.

Use F1 to start the engines. The power car has two engines which are started sequentially. After both engines have started the unit will stand with the diesel engines ticking over at idle.

Pressurised air is use to operate the controls. If the pressure drops when the units are stationary the engine revs will be raised, thereby increasing the output of the compressor to compensate.

These units have four gears, operated manually via Electro Pneumatic ("EP") valves producing a characteristic hiss. After accelerating in each gear, the engine is required to spool down to more closely match the speed of the gearbox before further gear changes are possible. This is why there is a long pause during gear changes.

The real units were only able to coast when in direct drive, 4th gear. When a period of coasting was anticipated if not already in top gear, 4th would be selected by the driver to facilitate this.

This sound project is designed to simulate all of these characteristics automatically, including the compressor speed-up when standing.

Some manual intervention is possible to modify the automatic sounds to suit all types of layout and user experience. After a little practice you will find these overrides substantially increase the accuracy of the simulation possible, and the satisfaction gained.

The sounds will respond to the throttle control in the following ways:

Automatic sequence
Select speed step 1. The engines will increase power to get the unit moving and will continue acceleration sounds until they reach maximum permissible revs. At this point, the engines will spool down ready to select 2nd gear. However, it will not be possible for the gear to change until the model achieves a scale road speed of approximately 15 MPH (around speed step 29) and so the engines will 'idle' between speed steps 1 and 28. Similarly, to achieve the following gear change, the road speed must be approximately 27 Scale MPH (speed step 44), and 4th gear at 41 MPH (speed step 56).

At this point It will cruise at a steady engine power. These points are all contained within the project, but the actual speed steps may vary slightly depending upon your controller.

In practice, this means that if you increase the speed steps to 56 in a smooth progression, the unit will increase in speed and provide realistic acceleration and gear change sounds.

Manual Intervention
If your layout does not have room for the full automatic sequence, the following options are available when idling sound is playing.

1. Engage F6. This will produce an immediate gear change followed by constant cruise sound. (Disengage to return to idling)
2. Reduce speed step by one, using your throttle control and immediately increase by one (or more). This will not have a visible effect on the road speed but will instantly initiate a gear change and acceleration sound. Adjust speed accordingly.

Option 2 allows you to force gear changes as often as you wish, at any road speed.

Deceleration
From any speed, if you reduce speed steps the automatic sounds will revert to 'engines idling' (as long as F6 is not engaged). This provides a convenient coasting control. If you send no acceleration commands, you may continue to reduce speed all the way to zero in coast mode, just as a real DMU would be driven. (Since F6 is manually controlled remember to disengage it before decelerating).

Light Loaded Mode
The real vehicles are relatively lightweight with power units adequate for their purpose. Performance varies widely, therefore, subject to loading and gradient. For added realism, we've provided the ability to run your DMU as if lightly loaded or full of passengers, uphill or down.

By default, the model will simulate a heavy loaded train, or one starting on an adverse gradient. Acceleration will be slow due to the high inertia, and the 1st gear acceleration sounds will be drawn out as the units struggle for speed.
To simulate a lightly loaded train, or one starting on a down gradient, engage F5 before opening the throttle. Performance will be transformed. Inertia is reduced so acceleration is rather more brisk and the duration of the 1st gear acceleration sound shortened, reflecting the earlier gear change possible.

Similarly the heavy train will take longer to come to a halt due the high momentum. Alternatively, using F5 will allow a 'light' train to stop more quickly.

Simulated Braking
By default, the model has a high momentum setting to provide a realistic coasting effect. This also makes stopping at a fixed position, say a station platform or signal post more like the real thing. The driver of a real Class 108 uses his skill, knowledge of the road and anticipation to achieve this; with practice you will be able to do this too. However, a real driver also has access to brakes, which modellers normally do not. Here are a couple of useful techniques you can use to simulate braking to over-ride the long deceleration that 'Coasting' provides in 'Heavy' mode.

1. If operating in heavy mode, reduce speed steps to zero and the units will Coast, gradually decelerating as described. Using F5 either in a succession of short 'dabs' or longer applications, the deceleration rate will increase producing simulated braking and increasing the accuracy of such stops.

2. In either mode, engage F19 before reducing speed. The models' response to any change in throttle request will be instant, so deceleration is totally under control of the throttle.

User Sounds

These vehicles were known for their noisy engines, squealing wheels, slamming doors with drop-light windows and external door knobs. They seemed to be forever accelerating, coasting and stopping in an endless cycle.

These characteristic sounds can be used on DCC under manual control. User sounds are not available on DC. Some of the F keys play one sound when switched 'On' and a different, complementary, sound when switched 'Off'. This helps to expand the number of different sounds available, and to allow the operator to determine the delay between one action and another, for example, the opening and closing a door.
The horn sounds are specific to each car; changing the direction of travel automatically selects the appropriate horn set.

Function list.

F0	Lights on/off
F1	Engines start up/shut down
F2	Hi-Lo Horns
F3	Lo-Hi Horns
F4	Lo Horn (acknowledgement toot)
F5	Light Loaded Mode
F6	Engine at cruise
F7	Flange squeal (adjustable length)
F8	Handbrake applied
F9	Air Tank drain down
F10	Guard's Whistle
F11 On	Guard's single buzzer
F11 Off	Driver's single buzzer response
F12 On	Guard's double buzzer
F12 Off	Driver's double buzzer response
F13 On	Driver's window opening
F13 Off	Driver's window closing
F14 On	Driver's door opening
F14 Off	Driver's door closing
F15	Passengers door slamming
F16 On	Passenger door droplight opens then the door opens
F16 Off	Passenger door closes then the droplight closes
F17	Windscreen Wipers
F18	Fade all sounds
F19	Acceleration/deceleration boost
F20	Horns – Ilkla Moor Baht'at
F21	Horns – Beethoven's 5th