

This is not a full blow by blow account of fitting a decoder to an Aristocraft class 66, as to be honest fitting the recommended Digitrax DG583AR is a simple matter of removing the bodyshell (12 screws), removing a DC blanking plate and plugging in the decoder.

However it has been reported by others that after fitting a Digitrax decoder to the loco the lower head and tail lights do not change direction reliably (if at all) under either DC or DCC unless the motor circuit is switched off. My loco exhibited the same problem.

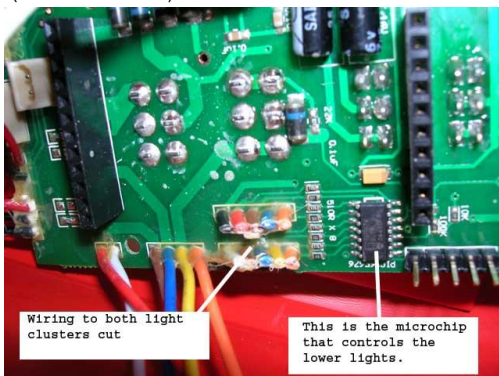
Investigation of the main circuit board shows that the lower light clusters are controlled by a PIC microcontroller chip, which (as far as I can tell) is intended to monitor the voltage polarity being fed to the motors and switch on or off the various head and tail lights accordingly. For the UK liveried models it also takes into account the night/day switch. Although this microcontroller driven arrangement works nicely on pure DC, it doesn't appear to be able to sense the motor voltage properly once a decoder is inserted into the motor circuit.

I spent a good couple of hours probing about and trying to influence the direction of the lights, but to no avail. I could get the lighting direction to change using a carefully positioned resistor but it would not work reliably as the loco's direction was reversed. Eventually I decided I'd have to "bite the bullet" and re-wire the lights directly to the decoder function outputs.

One obvious thing to do was to re-use the existing wiring harness and plugs as much as possible. The wiring for the lower lighting clusters runs along the chassis to a central circuit board with sockets, into which the wiring from the main circuit board is plugged. There are five wires to each light cluster circuit board:

- 1) common ground
- 2) left white light
- 3) both red tail lights
- 4) right white light
- 5) both outside marker lights (not fitted on my German HGK model)

I decided to cut the lighting cluster wiring at the main board, and reconnect the harnesses to a piece of copper-clad strip-board. Leaving a little of the original wire colour still present on the board should serve as a reminder if I ever need to return the wiring to original condition.  
(dscn0641a)

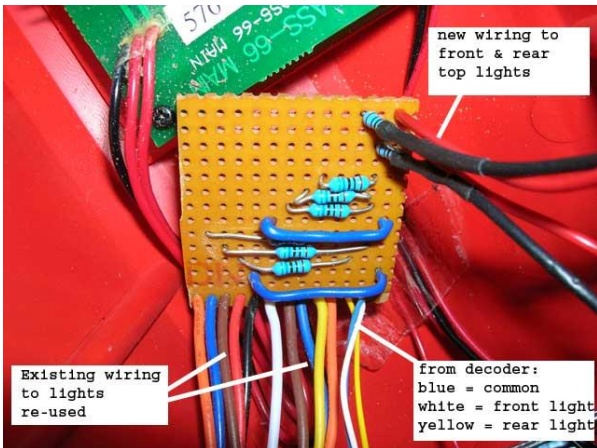


The decoder's function common, front headlight and rear headlight outputs are made available via an auxiliary connector, and these were also connected to the strip-board. 560 ohm resistors were then fitted to make connections from the cluster wires to the front or rear light outputs as required. A couple of jumper wires were also needed to link the common connections.

(dscn0648a)

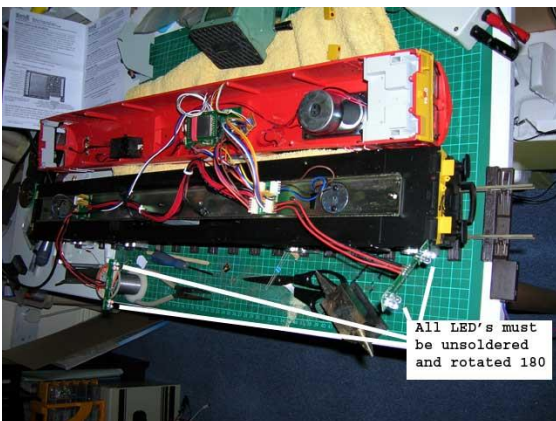


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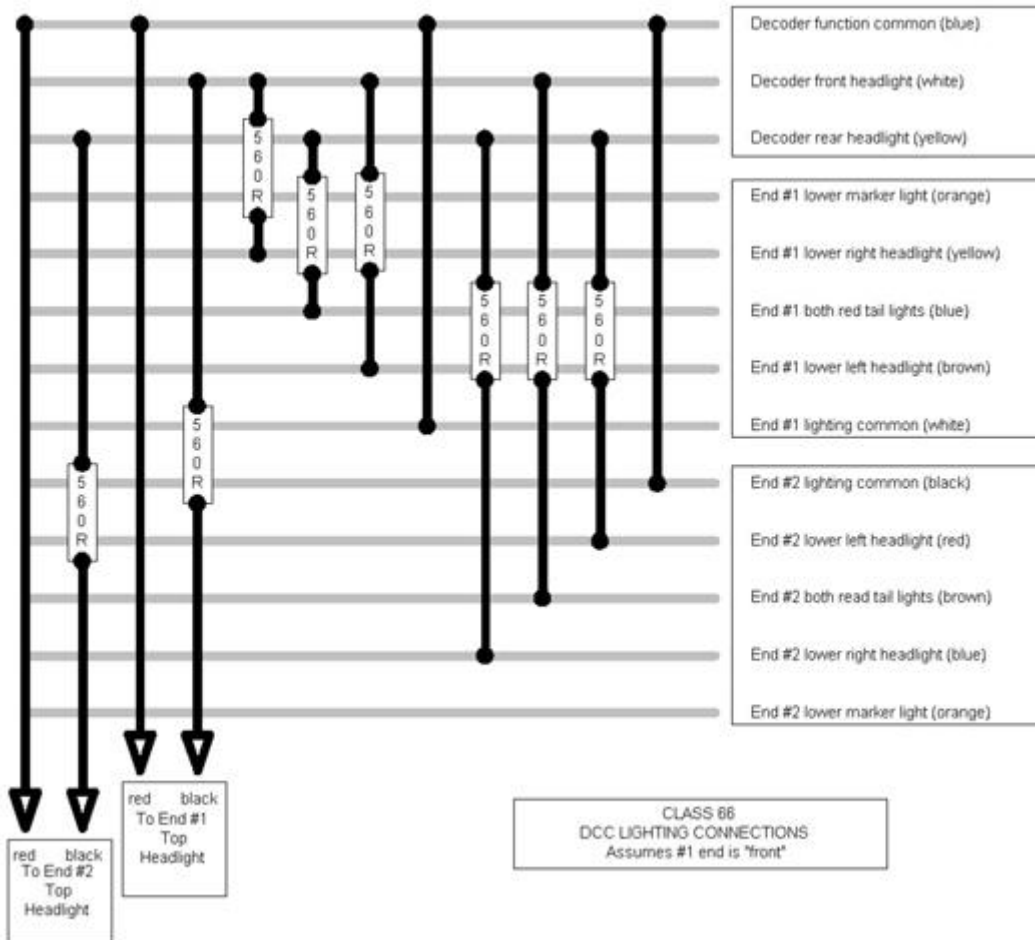
Unfortunately the light cluster circuit boards are wired with a common ground connection, whereas decoder function outputs use a common positive connection. OK, nothing for it but to carefully unsolder and remove each LED, rotate it 180 degrees and re-solder back into place!

(dscn0644a)



Note: I didn't bother wiring up the outside marker light connections on the strip-board as no LEDs are fitted on my German outline model.

Note: the strip-board connections as I built them do not provide for day/night switching as this is also not applicable on my German model. I'm sure this could be achieved quite easily by cutting the tracks feeding the day/night switch on the main board to isolate it, and arranging for the left or right lights to be fed via this switch. A friend has an EWS 66 and I think he's just bought a decoder for it, so if we end up doing a similar re-wire job including the day/night switch I'll document this too.



After successfully rewiring the lower lights to work as desired, I then noticed that the top headlights tended to flicker and were not the same brightness as the lower ones. This made me suspect that they too were not being fed directly from the decoder outputs. I elected to cut the wiring for the top lights at the loco ends, where the LED is wired to a small circuit board along with the cab lights. New wiring was run directly from the LED back to the new strip-board and connected to function common and the front or rear light decoder output as appropriate. A 560 ohm resistor was fitted in each circuit. (dscn0650a)



I'm pleased to say that the head and tail lighting now all works as I expect it to. Can't help thinking I could/should have rewired the cab lights to a decoder function too, but for now I'll just turn them off using the lighting switch!

(front and rear)

Nick

