A-TRAIN SYSTEMS

DCC Decoder Tester

Version 2

Before fitting a new DCC decoder into one of your locomotives, it makes sense to check that it is operational. This can be done with a simple Decoder Tester, shown in the schematic overleaf, which is constructed from a set of resistors and light-emitting diodes. Any colour or type of LEDs can be used, and all resistors, with the exception of R1 are 0.5 watt rated. R1 should have a 2 watt rating as a minimum (and preferably 3 watt), since it is intended to provide a load which stands in for the locomotive motor during programming, and will have to withstand the full DCC track voltage – nominally 14 volts for HO-scale.

Connections to the track and the decoder can be made using flying leads from the Tester, terminated in miniature crocodile clips (preferably insulated to avoid inadvertent short circuits), and which are plugged on to sets of pin headers, as can be seen in the photographs of a sample Decoder Tester shown later in the document. Alternatively, you can make up wiring harnesses with appropriate sockets to take the NMRA plugs fitted to some decoders, or you can fit sets of spring or screw terminals, again as shown in the photographs. The 4-position spring terminal blocks used in the example Tester (insert small instrument screwdriver to open each contact) are made by Camden – part number CSTBV23/4.

To use the Decoder Tester, connect to the decoder first, then attach the final two input leads to the track, or direct to the programming outputs from your DCC Command Station. If all is well, both LEDs L1a and L1b should light when power is applied to the track by the Command Station. If only one of these LEDs is lit then it indicates that plain DC is being applied to the Tester instead of DCC power (14 volts AC).

The other LEDs are driven from the outputs of the decoder under test. New decoders come with their address set to the default value of 03, so send DCC commands to this address and check that the appropriate LEDs light –

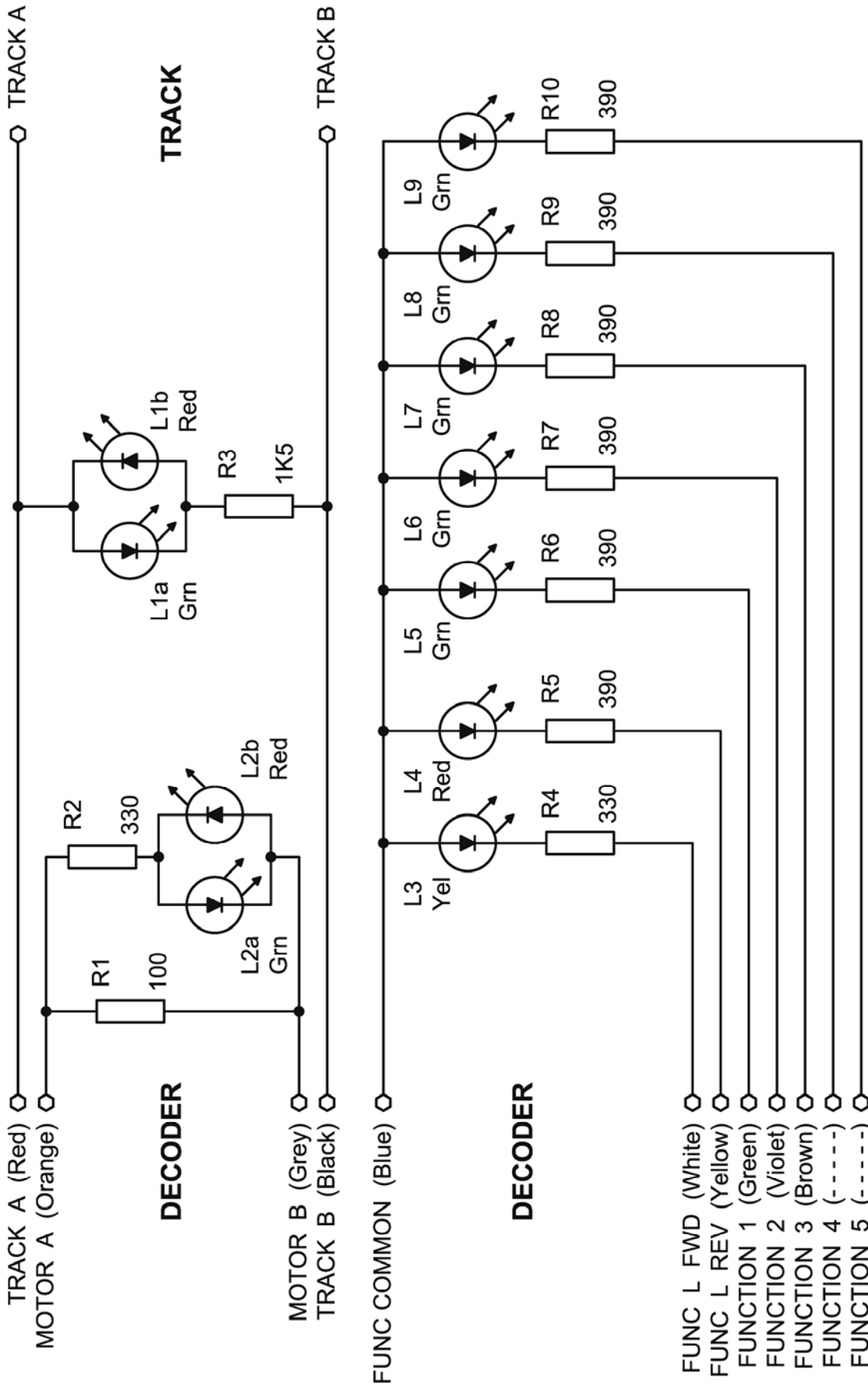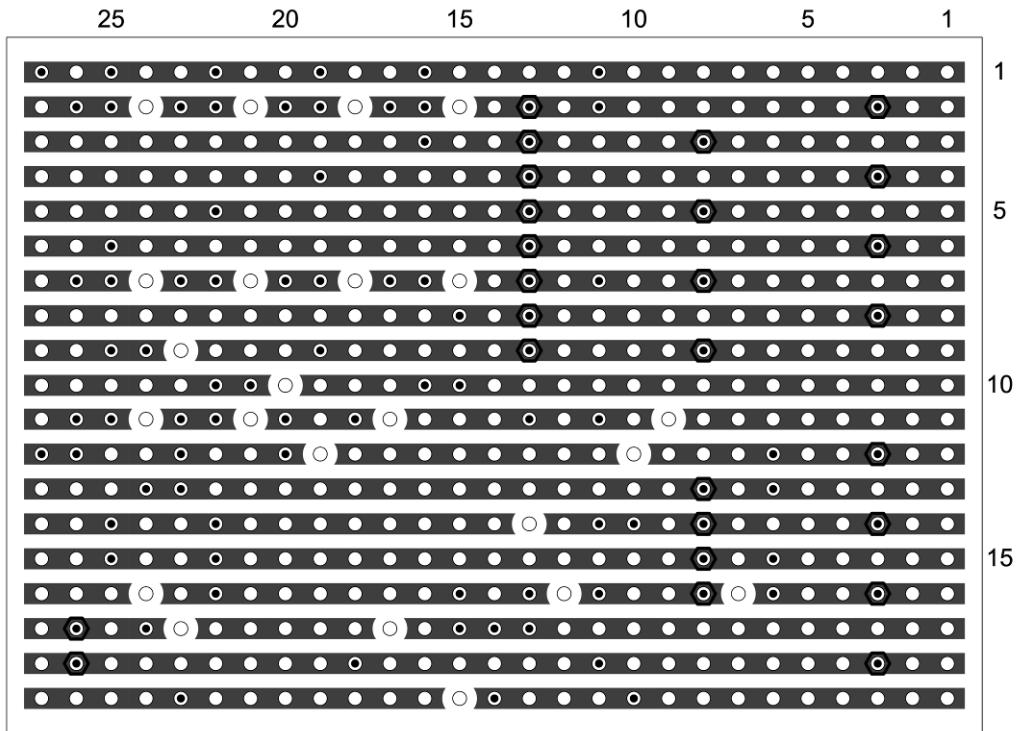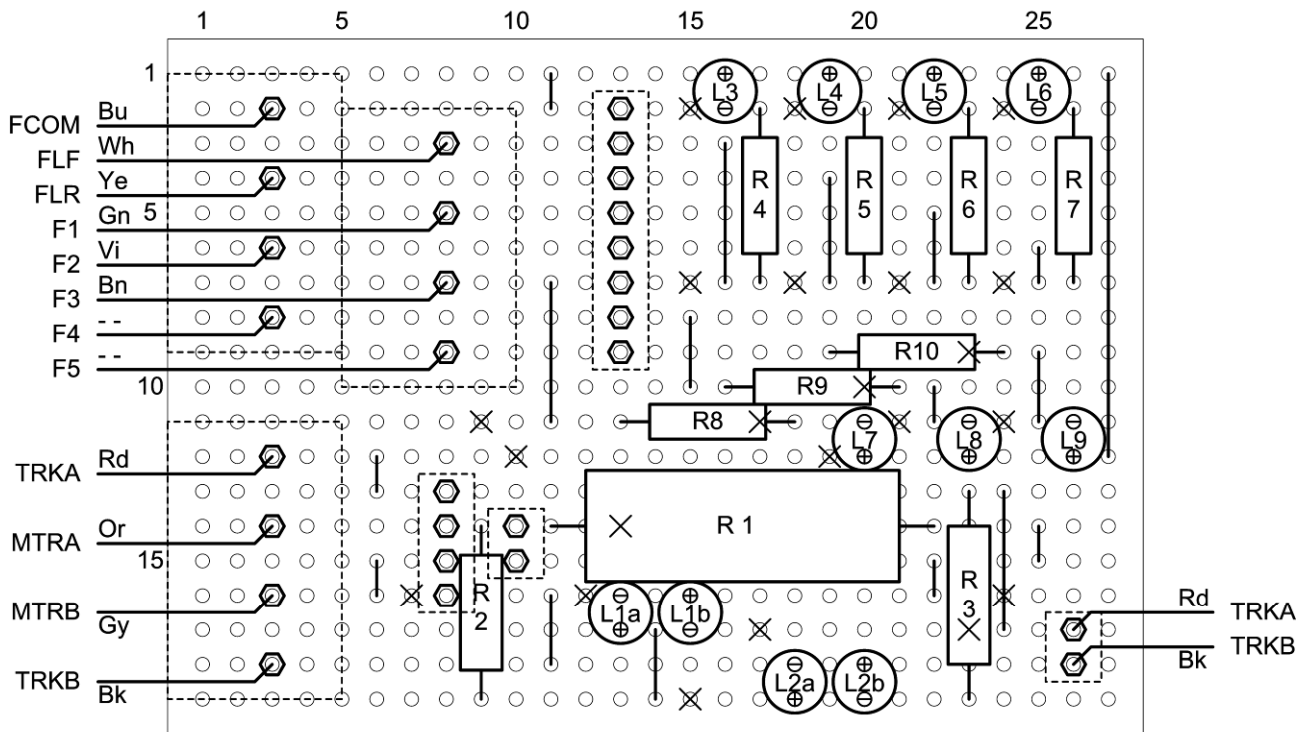|	
L2a = Motor Forward	L5 = Function 1
L2b = Motor Reverse	L6 = Function 2
L3 = Forward Light	L7 = Function 3 (if present)
L4 = Reverse Light	L8 = Function 4 (if present)
	L9 = Function 5 (if present)

A suggested layout for constucting the tester on stripboard is shown on the page after the schematic, and this is followed by a set of photographs showing a built tester and its various connecting harnesses.

TRACK A

TRACK

TRACK B

L1b
Red

R3
1K5

L1a
Grn

R2
330

L2b
Red

R1
100

L2a
Grn

L9
Grn

R10
390

L8
Grn

R9
390

L7
Grn

R8
390

L6
Grn

R7
390

L5
Grn

R6
390

L4
Red

R5
390

L3
Yel

R4
330

DECODER

TRACK A (Red)
MOTOR A (Orange)

MOTOR B (Grey)
TRACK B (Black)

FUNC COMMON (Blue)

DECODER

FUNC L FWD (White)
FUNC L REV (Yellow)
FUNCTION 1 (Green)
FUNCTION 2 (Violet)
FUNCTION 3 (Brown)
FUNCTION 4 (- - - - -)
FUNCTION 5 (- - - - -)

A-Track Decoder Tester

Circuit Diagram

DCC_TESTER_2.VSD

A-TRACK Decoder Tester

Stripboard Layout