

A-TRACK - User and Interface Hardware

Details of the various items of hardware required to connect [A-TRACK](#), running on an Atari 800XL, to the model railroad track, and to allow a user to control locomotives and other equipment on the railroad layout, are shown in the photographs below.

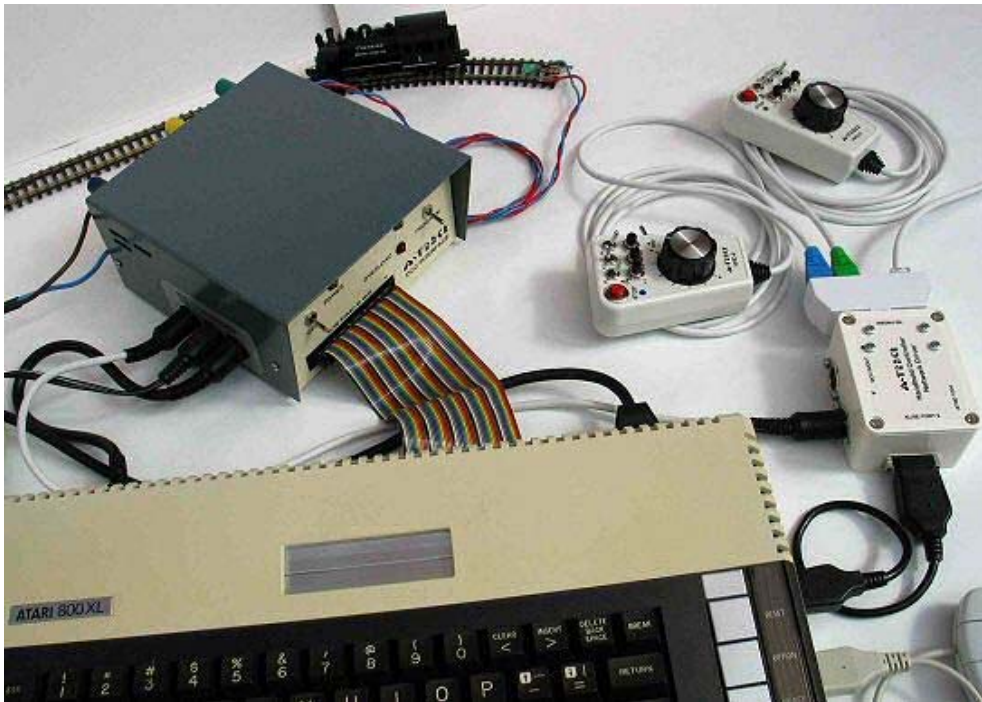
1 Overall Connections

The first picture shows the DCC Interface Unit (DIU) connected to the Atari 800XL Parallel Bus and then to the railroad track (see Sections 3.2 and 10.1 of the User Guide). Also shown is the Handheld Controller Network Driver connected to Joystick Port 2 (and powered from the DIU), together with two Handheld Controllers. An Atari ST mouse is connected to Joystick Port 1, and an Atari 1050 disk drive can just be seen in the background –



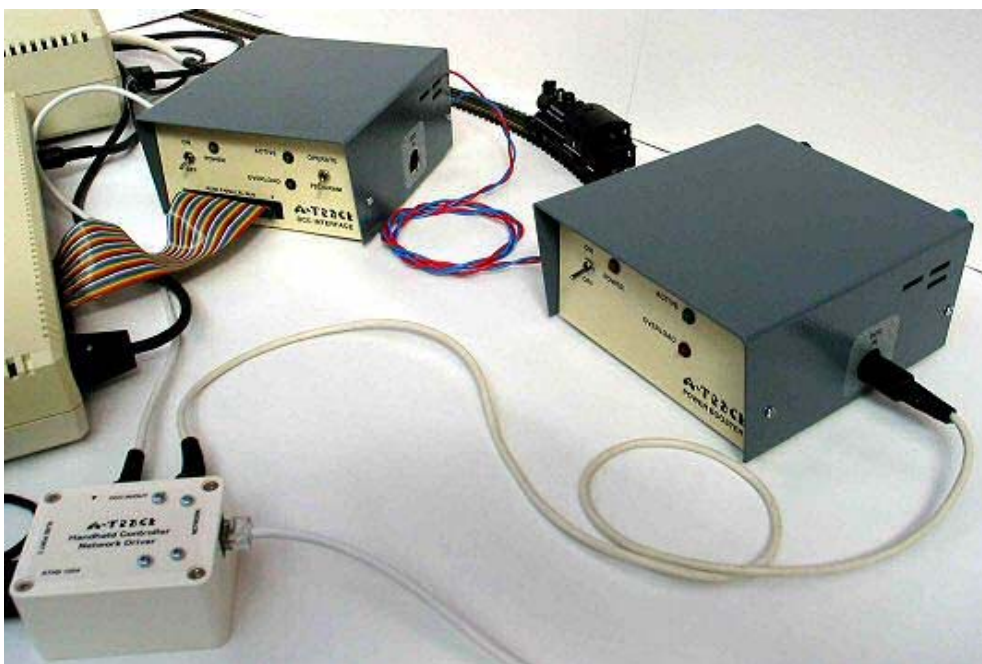
A view of the same equipment and connections from above is shown in the next picture.

For the model railroad enthusiasts, the locomotive in the picture is an HO-scale 0-6-0 Saddle Tank Switcher from the Bachmann Spectrum series, fitted with a Digitrax DZ121 DCC decoder. Decoder installation instructions for this locomotive, courtesy of Green Stream Products, can be found in the [Application Notes](#) section of the [Digitrax](#) website.



2 Powering Larger Layouts

The DIU can supply a maximum of 4 Amps to the track. Where this capability is inadequate to supply all of the locomotives and accessories that you want to operate simultaneously on the track, the layout can be divided into several electrically-isolated sections, often referred to as 'power districts'. One section (or district) is driven from the DIU, and each of the others will be driven by a slave Power Booster Unit (PBU) - see Section 11.3 of the User Guide for more details. The picture below shows one PBU connected to the DIU via the Network Driver -



3 Handheld Controllers

[A-TRACK](#) supports the use of up to eight Handheld Controllers (HHC) of the type shown in the picture below, allowing the simultaneous operation of eight locomotives or consists anywhere on the railroad layout –



As explained in Section 11.2 of the User Guide, the [A-TRACK](#) HHCs are connected via their 8-way RJ45 jacks into a wired network driven by the Network Driver unit from the Atari 800XL Joystick Port 2. HHCs can be unplugged and then reconnected into any convenient point of the network as an operator moves around the layout - the locomotive assigned to that HHC continues to run under [A-TRACK](#) control at the last set speed while the HHC is disconnected.

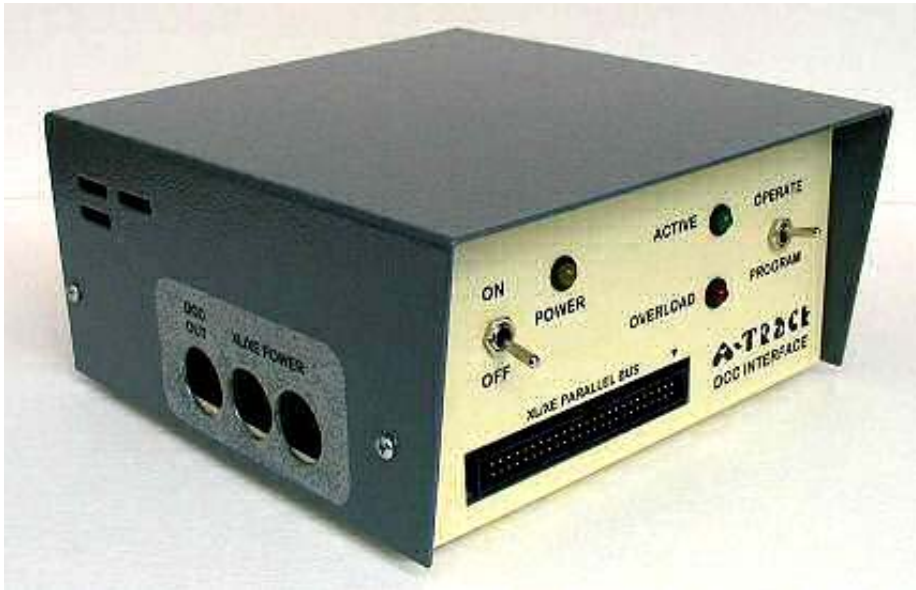
Each HHC incorporates a simple rotary speed control which can be set up for either centre-zero or uni-directional operation. In the latter case, the switch on the righthand side of the HHC selects forward or reverse direction. Three toggle switches and three pushbuttons provide control over other DCC locomotive functions such as lights and sound, while the large red pushbutton can be used to immediately stop all locomotives on the layout in case of an emergency (such as an imminent collision or derailment) -

4 Equipment Details

4.1 DCC Interface Unit

The DIU connects to the Atari 800XL Parallel Bus and converts DCC commands from the [A-TRACK](#) software to an appropriate digital signal to control, and to program, DCC

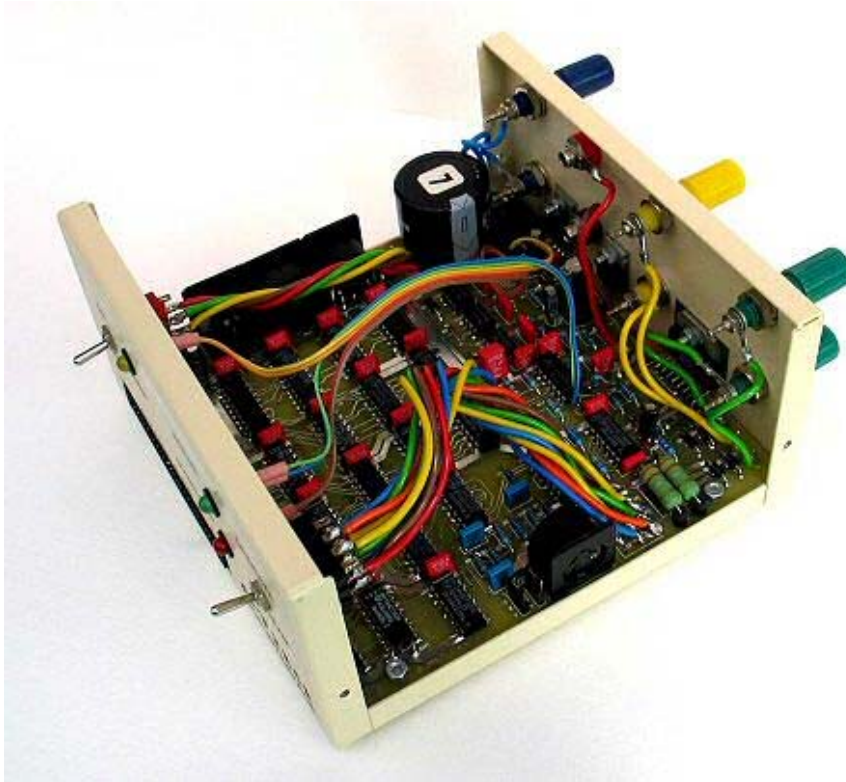
decoders fitted in locomotives running on the layout tracks. The DIU is powered from the Atari XL/XE computer power supply -



Power for the railroad tracks is derived from a 15 Volt AC 4 Amp transformer connected to the blue terminals on the rear panel of the DIU. The DCC output signal, used to both power and control locomotives on the layout tracks, is available at the green terminals, while a separate DCC output from the yellow terminals is taken to an isolated section of track for the purposes of programming the DCC decoders fitted in the locomotives -



An internal view of the DIU is shown below. The front section of the circuitry takes the DCC command data from the Parallel Bus input and converts it to a serial stream of bits conforming to the DCC standards. This bitstream then drives the rear section of the DIU to produce the full-power DCC output to the layout tracks -



4.2 Power Booster Unit

The construction of the PBU is very similar to that of the DIU, except that it does not have a Parallel Bus connector nor an output to a programming track, as shown in the pictures below -



Each PBU is powered from its own 15 Volt AC 4 Amp transformer connected to the blue terminals on the rear panel of the PBU.

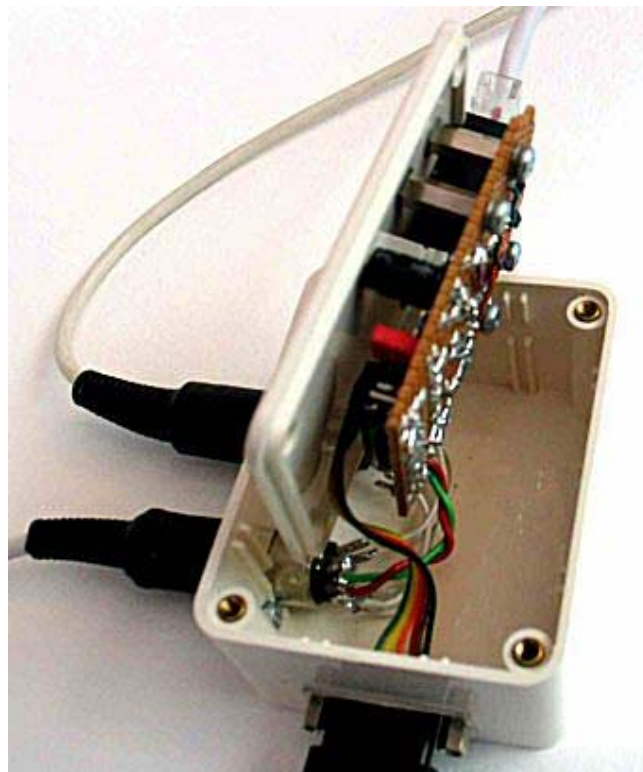


Internally, the circuitry of the PBU uses the same PCB as the DIU but the front digital section is omitted, and the rear output section is driven directly by a connection from the DIU or a preceding PBU. Several PBUs can be connected in series from a single DIU, which provides the necessary power for them all (see Section 11.3 of the User Guide for details) -



4.3 Network Driver

The Network Driver is a simple buffer which allows the Atari 800XL Joystick Port 2 output signals to drive the 8-wire network to which the A-TRACK HHCs are connected. The Network Driver takes its power from the DIU rather than from the Joystick Port, and provides this power, together with the DCC bitstream signal, to any PBU which is connected into the system. The various input and output signals can be seen in the pictures below -



4.4 Handheld Controller

An internal view of the [A-TRACK](#) HHC is shown below. The circuitry is powered from the Network Driver through the 8-wire network provided around the layout, and enables the settings of the various HHC controls to be interrogated by the [A-TRACK](#) software and then used by the program to generate the necessary DCC commands.

