

# INSTALLATION INSTRUCTIONS

## **FX-4U with FX-2A** **UNIVERSAL INTERFACE MODULE** **for FX-4U 1v1 Soundcard**

### INTRODUCTION

N.B. THE **FX-4U** MUST NOT BE CONNECTED DIRECTLY TO THE CONTROLLER WITHOUT THE **FX-2A**.

The **FX-2A** Universal Interface Module enables the **FX-4U** digital sound card to be used with almost any type of controller whether it is conventional analogue voltage 2-rail, battery R/C, pulse power high or low frequency, on a low voltage DC supply which can be battery or mains derived. Hence its name **FX-2A** ..... **FX to Anything**, well almost!

The maximum input voltage depends on the version of **FX-4U** being used i.e. 18v for the 2 watt model, or 24v for the 5 watt.

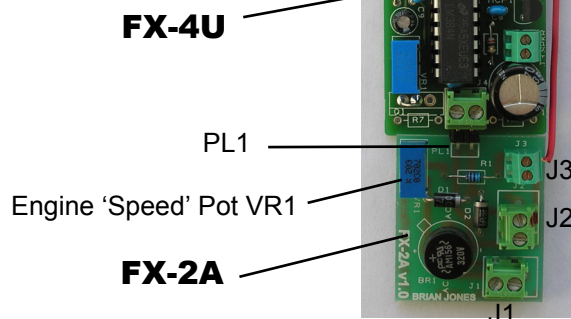
PL1 - Power out to FX4U

### Figure 1- FX-2A Connectors

J1 - From 2-rail Track pickups or controller motor drive outputs.

J2 - Battery power input

J3 - Analogue measurement output  
(N.B. Uppermost contact)



DO NOT in any circumstances drill any holes through the **FX-2A** to fix it in place. Do not remove the sleeving or serial number label from the bottom of the unit. This is used to identify your module.

**ELECTRICAL CONNECTIONS** - Refer to Figure 1 above and the diagrams, figures 2 & 3, overleaf.

The battery power input, J2 is protected against reverse connection. The track pickup/motor drive connector, J1, is non-polarised. **Strip and 'Tin' all multi-stranded wire connections with solder, before clamping in the screw terminals. Do not over-tighten them. Note that the clamps in the screw terminals rise when tightened, so put wires above the clamps, not below.**

### OVERLOAD PROTECTION

Fuses or cut-outs for the sound card should be 500mA maximum rating. Fit one in the positive battery supply line to connector J2, and another to controller input connector J1, on the **FX-2A**, as shown in figures 2 and 3 overleaf.

### TESTING AND RUNNING

Double check the wiring against the circuit diagrams in Figures 2 or 3 as appropriate to your loco. Make sure there are NO loose connections, including on/off switches with faulty contacts. Intermittent power connection will cause the **FX-4U** and **FX-2A** to malfunction. Once satisfied that the wiring is correct, switch on the battery power. If the power is turned off, allow 10 seconds before switching back on.

### 'ENGINE SPEED' SOUND SETTING - POT VR1

This pot has to be set to suit the maximum DC track voltage (for 2-rail locos), or the battery voltage if used with battery locos. For large scale battery locos this is normally factory set to 24 volts. If it needs to be reset, the following procedure can be used:- Set the loco on blocks with its wheels clear of the track. Run the loco at full speed; direction is not important. Adjust VR1 on the **FX-2A** until the engine sound speed drops a notch, and then turn it back until full speed sound is obtained. Leave it at this setting and run the loco at full speed in the opposite direction. It should reach 'full speed' sound again. If it doesn't, adjust VR1 until it does, then check that the original direction still reaches full speed.

### HORN/WHISTLE SWITCH INPUT (See figs 2 & 3 on page 2)

This must be a switch with normally open contacts when not in use. Wiring between this input and the switch should be kept as short as possible. Make the wires from the switch to the terminal block a twisted pair and do not allow the wires to run adjacent (i.e. parallel) to other wiring which may be carrying current to inductive devices, such as motors or solenoids. Otherwise, spikes induced on this input from such devices may trigger the horn sound.

### MOTOR SUPPRESSION

All motors, whatever their size should be suppressed against interference as the extreme voltages produced by such interference may damage the FX-2A/FX-4U sound module. Some motors come fitted with suppression components in which case they do not generally need any extra suppression.

### RECOMMENDED OPERATING CONDITIONS

Working Voltage:

- With 5 watt FX4U - 0v to 25v AC/DC on J1 track/motor input  
- 8.4v to 25v DC on J2 battery input
- With 2 watt FX4U - 0v to 20v AC/DC on J1 track/motor input  
- 8.4v to 20v DC on J2 battery input

N.B. IF FOR ANY REASON YOU NEED TO RETURN YOUR **FX-2A** PLEASE RETURN IT IN THE ANTI-STATIC BAG IN WHICH IT WAS SUPPLIED, OR WRAPPED IN ALUMINIUM FOIL BEFORE PACKING.

### **WARNING! - FOR HEALTH & SAFETY**

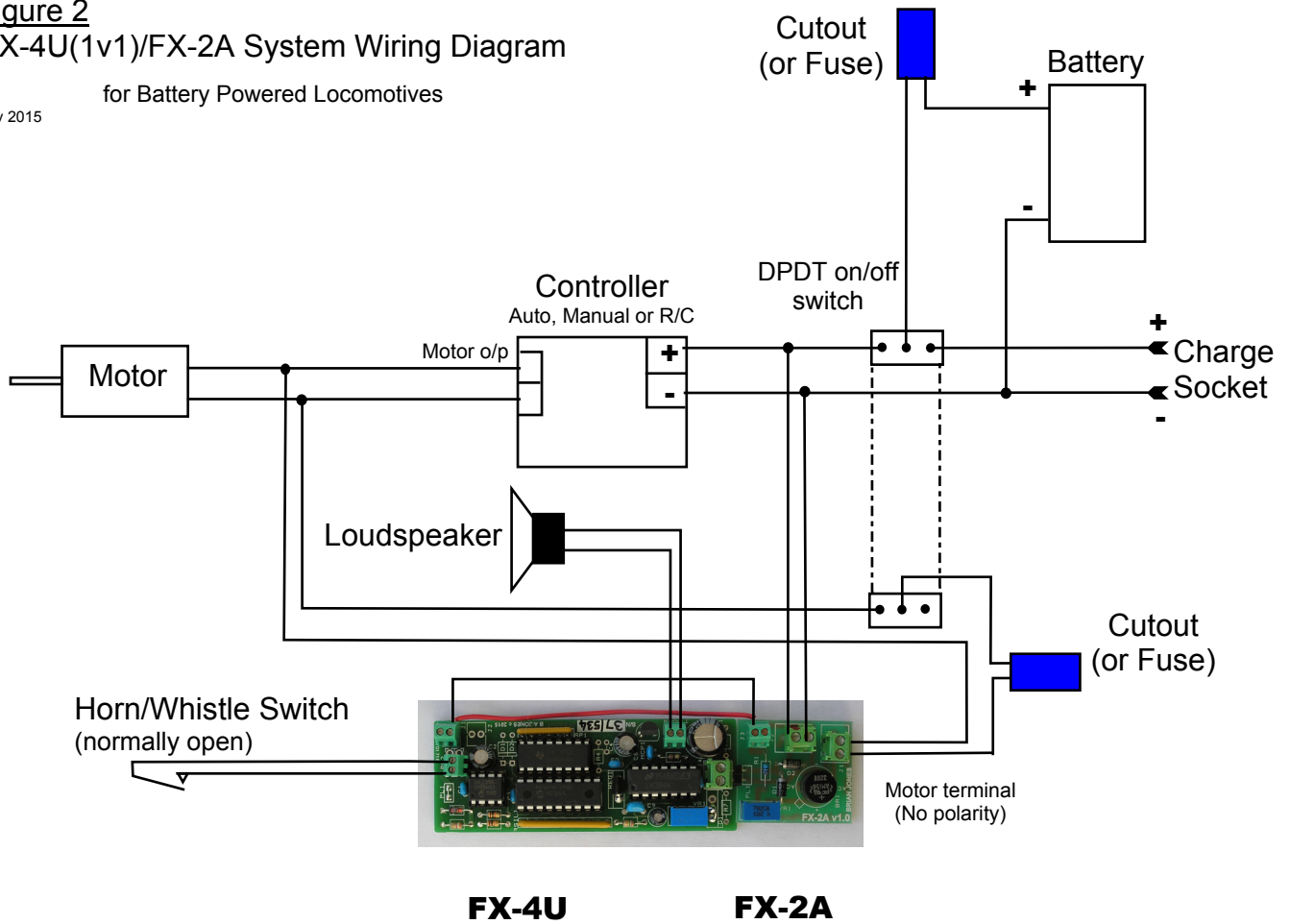
**DO NOT OPERATE AN FX-4U & FX-2A WITH A 5 WATT (OR LARGER) SPEAKER ON FULL VOLUME WITHIN 20 FEET OF ANY PERSON OR ANIMAL OUTDOORS, OR WITHIN 40 FEET IN A CONFINED SPACE. LOSS OF HEARING MAY RESULT IF DUE CARE AND ATTENTION IS NOT APPLIED IN OPERATING THIS PRODUCT.**

**I.E. USE COMMON SENSE!**

**Figure 2**  
**FX-4U(1v1)/FX-2A System Wiring Diagram**

for Battery Powered Locomotives

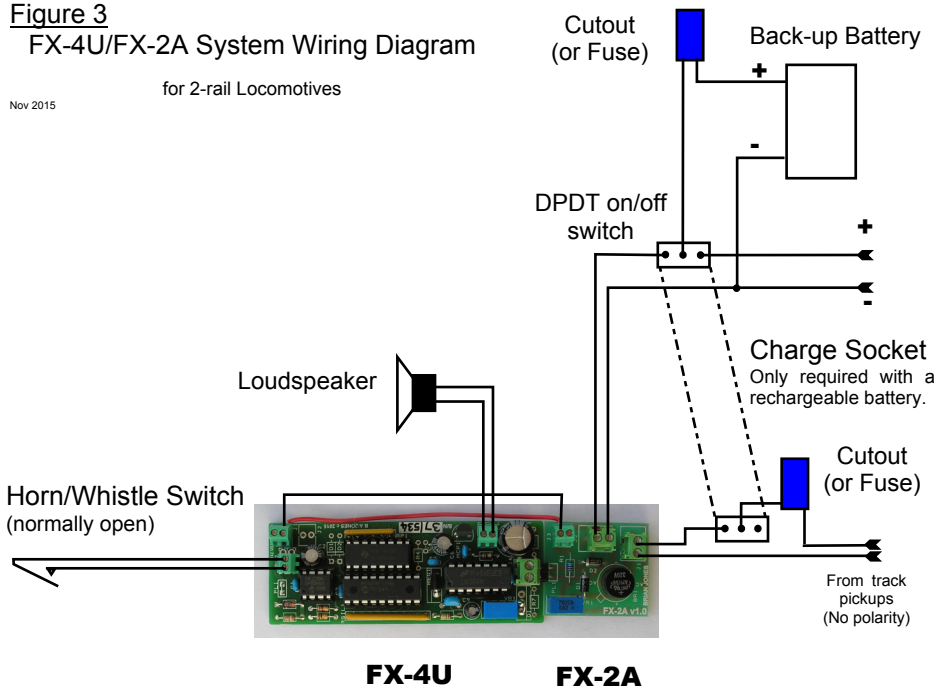
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**Figure 3**  
**FX-4U/FX-2A System Wiring Diagram**

for 2-rail Locomotives

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**N.B.** A DPDT switch is used for power on/off so that the loco can be run with the sound off

NO LIABILITY IS ACCEPTED FOR MISUSE

**FX-4U** Sound cards and **FX-2A** interface modules have not been tested on locos fitted with MTS or DCC decoders.

Specification of the **FX-4U** and **FX-2A** may vary according to the application of an actual unit. BJ's policy is one of continual improvement, and thus the right is reserved to alter the specification from that shown in this document.

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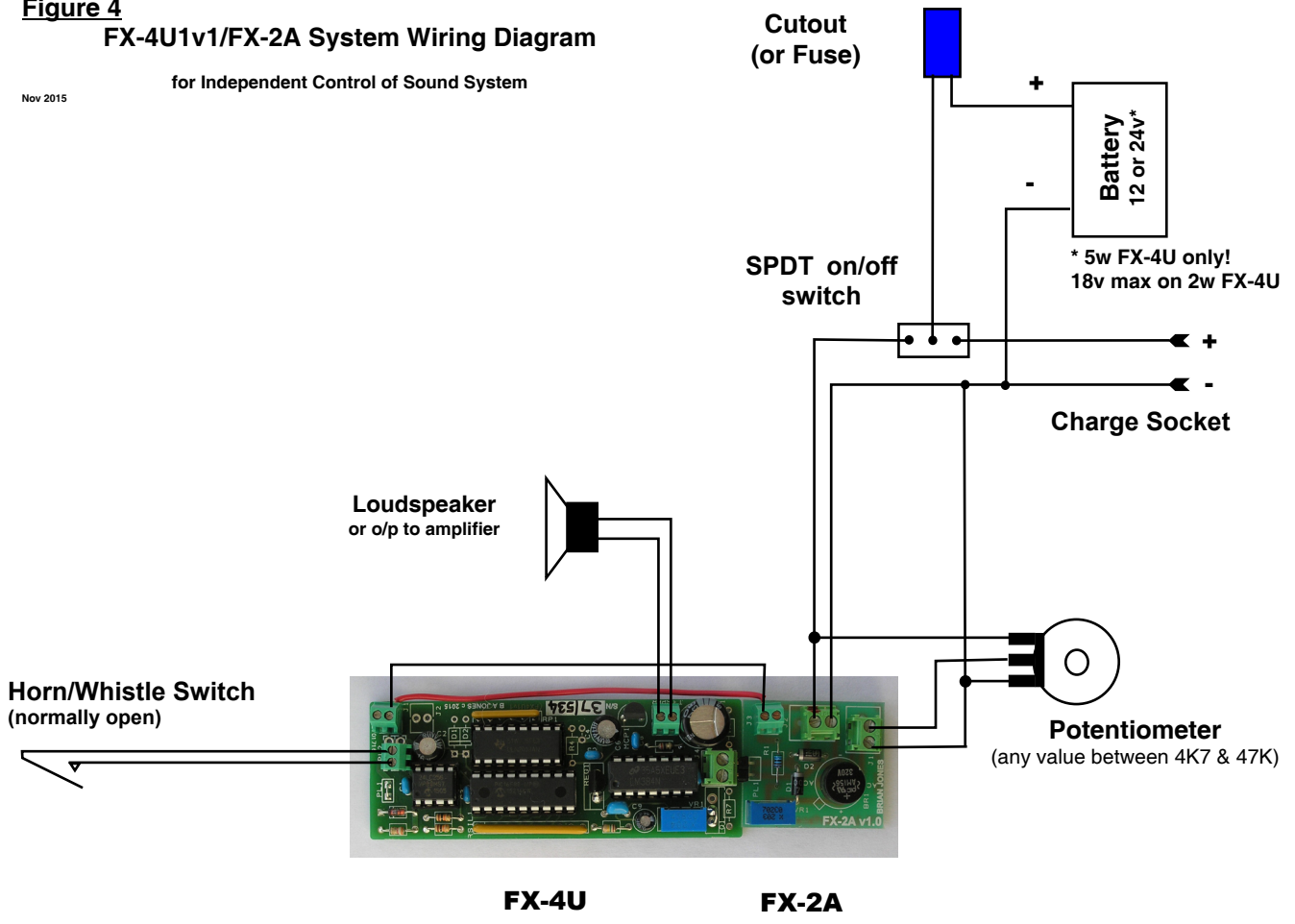
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**Figure 4**  
**FX-4U1v1/FX-2A System Wiring Diagram**

for Independent Control of Sound System

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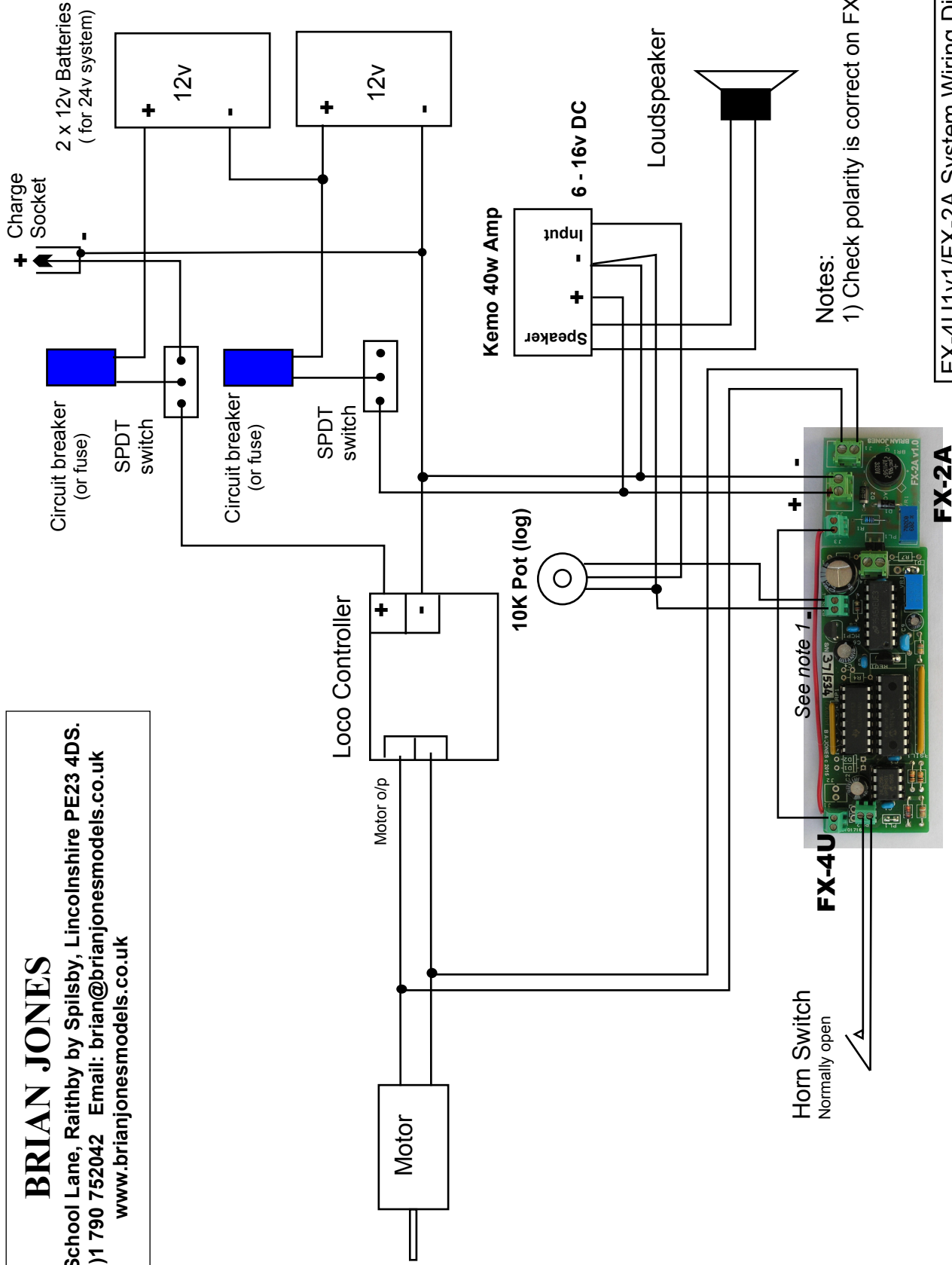


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Horn Switch  
Normally open

See note 1

Notes:  
1) Check polarity is correct on FX-4U

FX-4U1v1/FX-2A System Wiring Diagram  
with 40 watt KEMO Amplifier

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