

MODEL 751D OPERATING AND CONNECTION INSTRUCTIONS

FOREWORD

The model 751D is a simple, yet sophisticated circuit that will allow you to safely provide a momentary switching pulse to activate twin coil turnout solenoids and at the same time provide steady power to LED or incandescent lamp indicators and/or trackside signals. Connections are straight forward as are mounting methods. Please be sure to follow the guidelines herein to ensure safe and successful installation and operation. These instructions assume that the reader is acquainted with and experienced in wire connection and soldering techniques and thus these practices are not described.

THE CIRCUIT

The circuit diagram is shown below. Note the connections to both LED and solenoid coils are shown. 12Volts DC supply voltage connections are also shown. The connections shown correspond with those marked on the 751D printed circuit board.

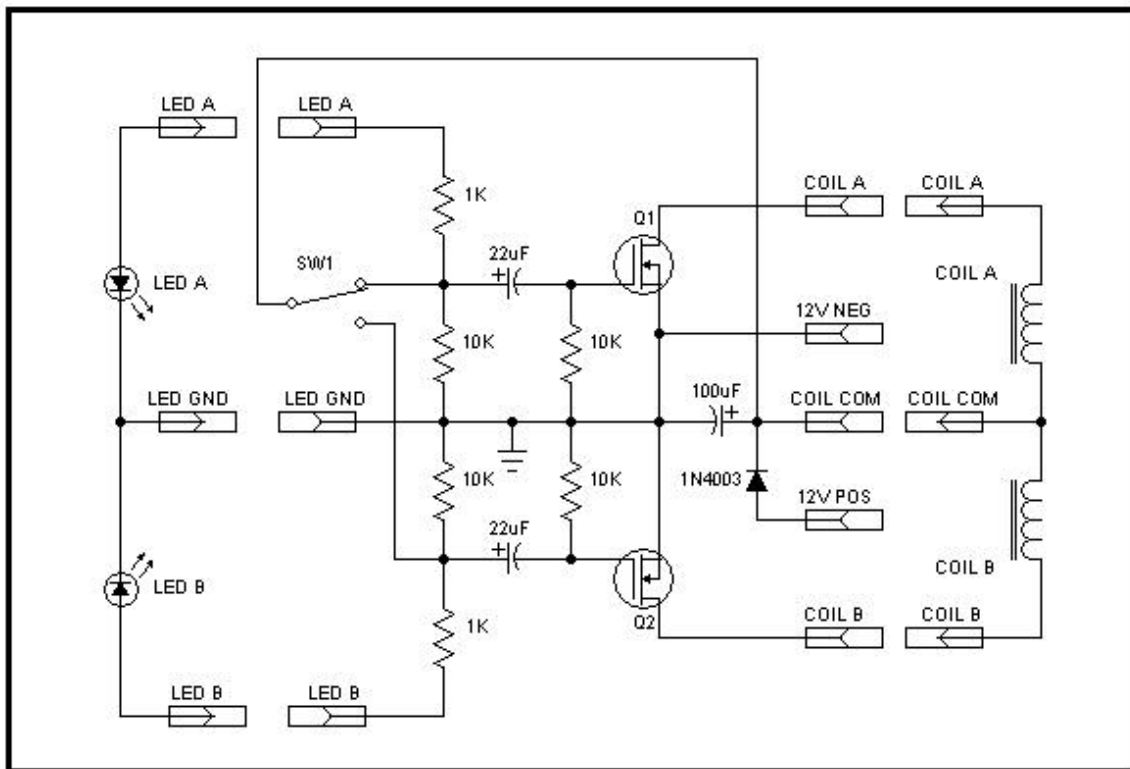


figure 1 – 751D circuit diagram

CONNECTIONS – refer to FIGURE 2

Step 1 – First, connect your twin coil turnout solenoid to the printed circuit board at the terminals marked **COIL A**, **COIL B** and **COIL COM**. If using three wire coils the common lead goes to the **COIL COM** connection. If using separate coils then one connection from each coil will connect to **COIL COM**.

SUGGESTION – I like to use 4 conductor 24AWG telephone cable (quad) for my 3 wire coils. The extra wire can be “dead dressed” around the outer jacket of the cable and can be used as a spare.

Step 2 – When you have the switch machine (coils) connected it’s time to apply power. Connect the 12V DC power positive supply wire to the connection marked **12V POS** and the 12V DC power negative supply wire to the connection marked **12V NEG**. **Connections must be made with power switched off to prevent damage to the circuit and to ensure no personal injuries occur.**

Step 3 – Once you have completed steps **1** and **2** be sure to double check wiring. When you are satisfied that the connections have been made properly and the wiring is secure you can apply DC power to the circuit and test operation of the circuit. When you are satisfied the circuit functions as it should, proceed to **Step 4** if you are installing indicator lamps or LEDs, or, proceed to **Step 5** if you are not installing indicator lamps or LEDs.

Step 4 – LEDs – connect both cathodes of the indicating LEDs to the terminal marked **LED GND**. Connect one of the LED anodes to **LED + A** and the other LED anode to **LED + B**. If you plan to use more than one set of LEDs you will place a wire jumper across the 1KOhm resistors and then use external current limiting resistors for each set of LEDs.

- When using incandescent lamps you will place a wire jumper across each of the 1KOhm resistors and then connect the lamps in the same manner as the LEDs (polarity is not observed for lamp installation).

Step 5 – Power the circuit and orient the LEDs in a manner that reflects the desired indication relative to your turnout position and toggle switch position. When you are confident that you have everything configured to your preference, power down, bundle the wires together, and then secure them to the circuit board with the nylon tie strap. The switching circuit and LEDs are now ready to install permanently in your panel.

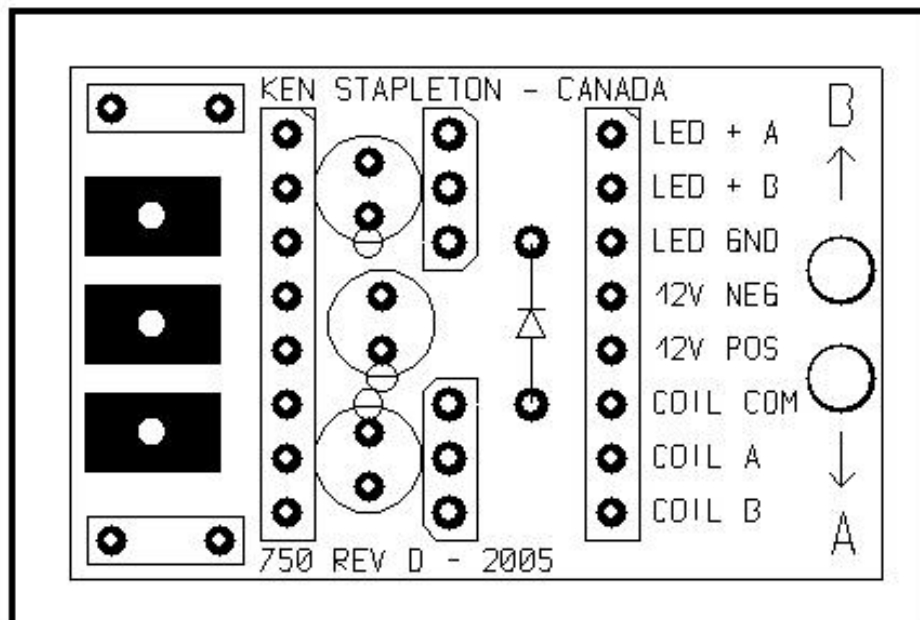


figure 2 – 751D printed circuit board connections

TABLE OF PARTS REQUIRED FOR EACH 751D CIRCUIT

Qty	Part	Digikey part #	Manufacturer #
1	Resistor network – 10K X4	4608X-2-103-ND	Bourns 4608X-102-103
2	Aluminum electrolytic 22uF/16V	493-1037-ND	Nichicon UVR1C220MDD
1	Aluminum electrolytic 100uF/16V	493-1040-ND	Nichicon UVR1C101MDD
2	N channel MOSFET	IRLU014N-ND	Int'l Rectifier IRLU014N
2	1/2W resistor – 1KOhm	PPC 1.00K XTR-ND	Vishay/BC SFR16S 1.00K
1	Diode – 1N4003	1N4003	Diodes Inc 1N4003
1	Switch – SPDT (ON-NONE-ON)	EBAY SELLER	hongkongsuperseller
1	3.5" nylon cable tie		

ASSEMBLY NOTES – DO's, DON'T's and HINTS

- You will most likely be assembling the 751D by using the supplied 751D as a sample of how the finished item will look. Be sure all parts are oriented in the printed circuit board as per the sample. 3 electrolytic capacitors are polarity sensitive, 2 MOSFET transistors are polarity sensitive, 1 diode is polarity sensitive. These components MUST be mounted exactly as per the sample. The 8 pin resistor network has orientation marks but can be installed with the orientation mark in either direction as it is an isolated 4 resistor part. You can use 4 conventional ¼ watt 10Kohm resistors instead of the resistor network by installing them in the vertical position with one leg bent over.
- Note – the positions where you will mount the two 22uF radial aluminum electrolytic capacitors have provision for 0.100" lead spacing or 0.200" lead spacing. Use only the two holes farthest apart or the two holes closest together for each component. Again, be sure to observe polarity.
- The part numbers given in the above table are presented as suggested part numbers only. You should feel free to use most any manufacturer's parts provided they meet the minimum specifications of the listed parts as well as the physical parameters required. Part specifications can be found on DigiKey's web site at <http://www.digikey.com>
- You can use a garbage bag twist tie, a length of string, or even a small piece of insulated solid wire to retain the field wiring in place of a nylon tie strap. Just be sure that whatever you use doesn't have a chance to cut through your wires and won't present a short circuit hazard.
- Do not attempt to drill or enlarge printed circuit board holes as they are plated through and by drilling you will remove the through hole plating which can alter or adversely affect the operation of the finished circuit.
- Use only ROSIN core electronic solder. Do not use acid flux based solders as the acid will dissolve the printed circuit traces over time and result in adverse/intermittent operation.
- Field wiring should be 24AWG solid wire – I recommend telephone "station Z" 4 conductor jacketed wire. Alternately, if you plan on installing trackside signals, I recommend telephone "3 pair" cable. This will give you 3 wires to use for your turnout coils and 3 wires to use for your signals.
- It's best to solder the SPDT switch to the printed circuit board last.

- Always leave one nut on the switch's mounting bushing to be installed behind your panel. If you do not use this "back up" nut you will most likely end up destroying the switch by either distorting the metal switch casing component or inadvertently forcing the bushing away from the switch body when tightening the outside bushing nut. Switch is mounted in either a 1/4" or 6mm hole.
- If you plan to use more than one set of LEDs or if you plan to use light bulbs or a combination of both LEDs and light bulbs, you should jumper the 1KOhm resistors (better yet, don't install them and replace them with a small piece of wire). LED sets will then require their own limiting resistors installed external to the printed circuit board assembly. Sometimes wiring more than 1 set of LEDs can be done in a series wiring arrangement, but you'll have a lot of wiring to do and if you're inherently lazy (like me) you probably won't want the aggravation.
- Be sure that you use this circuit with only 12VDC supplies. Don't eat the circuit, keep little folks safely away, mount in a fire resistant location, don't put the circuit in ANY holes in your body.....get the message? Common sense folks!
- Last point – IF YOU ARE IN DOUBT ABOUT ANY ASPECT OF THIS CIRCUIT OR IT'S CONSTRUCTION, GET IN TOUCH WITH ME. Here's my contact information;

<http://www3.sympatico.ca/kstapleton3/Index.html>

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