

Pickup Tone Multiplier™ Board Testing Instructions

Updated: January 15, 2012

Before you start, **read these instructions first** to understand what you need to do to test this product. These testing instructions are for our assembled T2-Board, T3-Board and T4-Board products. Perform this test *after* you have assembled the KIT version of our **Pickup Tone Multiplier™** (PTM) board.

REQUIRED TOOLS

You need the following tools to test your assembled PTM board.

- Wire cutters / Wire strippers
- Small straight slot screwdriver
- Ohmmeter with alligator (or other gripping) clips on probe tips to measure electrical continuity

Note: When you are using an ohmmeter, the following definitions apply.

open-circuit = no electrical continuity

close-circuit = electrical continuity (typically 0.7 ohms or less)

PREAMBLE

This document contains the functional test procedure to confirm that the assembled PTM board works the way it is supposed to. You need to confirm that the PTM board functions correctly *before* you install it into your instrument.

To perform this test you will use a standard ohmmeter that measures electrical resistance/continuity and also use several small jumper wires. Your PTM Kit contained a length of **blue** insulated stranded wire. Using wire cutters / wire strippers, cut this wire into four, five or six 1.5” (3.81cm) long pieces. Strip 3/16” (4.76mm) insulation from each end of all wires and twist the wire strands at each end so that they are tightly bundled. You can optionally “tin” the wire ends with a soldering iron and solder.

HOW TO ATTACH WIRES TO THE PCB TERMINAL STRIP

Here is how to attach wires to the **green** Terminal Strip. Using a small screwdriver or writing pen tip, press down on each square *release button* located above the corresponding wire hole. While holding the button down, insert the stripped wire into the wire connection hole and then release the button. Lightly tug on the wire to confirm it is firmly gripped by the Terminal Strip.

A legend is printed on the circuit board and names each of the terminal strip wire holes from left to right.

T2-Board (6-hole terminal strip): [GND] [VOL] [+]NECK[-] [+]BRDG[-]

T3-Board (8-hole terminal strip): [GND] [VOL] [+]NECK[-] [+]MIDDLE[-] [+]BRIDGE[-]

T4-Board (10-hole terminal strip): [GND] [VOL] [+]NECK2[-] [+]NECK1[-] [+]BRDG2[-] [+]BRDG1[-]

Warning: Do not insert hard implements into any of the wire connection holes – especially if the *release button* is not pressed down. Doing so will deform and weaken the gripping spring and decrease reliable electrical connection. We do not warranty Terminal Strip damage caused by this behavior.

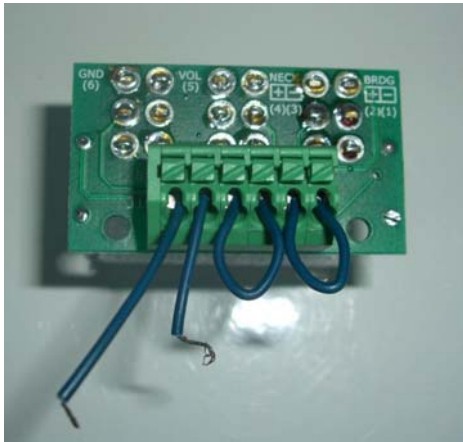
This document contains separate test procedures for the T2-Board (for 2-pickup coils), T3-Board (for 3-pickup coils) and T4-Board (for 4-pickup coils). Go to the applicable test procedure for your purchased board version.

T2-BOARD: 2-PICKUP COIL BOARD TEST

Use this test procedure to validate correct operation of your assembled T2-Board (or *KIT-T2*) product.

Use each of two 1.5" (3.81cm) long blue wires to jumper between the "+" to "-" hole locations on the green Terminal Strip for the [+]NECK[-] and [+]BRDG[-] pickup coils. Confirm that the ends of the wire are firmly gripped by the terminal strip by gently pulling on each wire. These temporary jumpers are used to "simulate" pickups being connected to the PTM board.

Insert each of two 1.5" (3.81cm) blue wires, one wire into the [GND] hole location, and the other wire into the [VOL] hole location on the green Terminal Strip. Confirm that they are firmly gripped by the terminal strip by gently pulling on each wire. Connect the ohmmeter leads to the [GND] and [VOL] wires that are attached to the Terminal Strip.



Here is what your T2-Board looks like with the wires attached.

For this test, the following switch positions are referred to as the **Start Position**.

Set switches SW1 and SW3 to off (center) position
Set switches SW5 to *Parallel* (down) position

Note: open-circuit = no electrical connection,
close-circuit = electrical continuity (typically 0.7 ohms or less).



Shows which way is UP/DOWN with reference to the board

Note: If you see a high resistance during testing for the "open circuit" state (e.g., in excess of 1 megohm) this is of no consequence. Your **Pickup Tone Multiplier™** switching system will perform as stated.

Place all switches into **Start Position**. Meter reads open-circuit.

Move switch SW1 up. Meter reads close-circuit. Move SW1 down. Meter reads close-circuit. Move SW1 to center. Move switch SW3 up. Meter reads close-circuit. Move SW3 down. Meter reads close-circuit. Move SW3 to center.

Place all switches into **Start Position**. Meter reads open-circuit.

Move switch SW4 up to *Series* position. Meter reads open-circuit.
Move switch SW1 and SW2 up. Meter reads close-circuit.

This completes the 2-pickup coil **Pickup Tone Multiplier™** board test. If you received the stated meter results, remove the jumper wires from the green Terminal Strip and proceed to the **Pickup Tone Multiplier Board Installation Instructions**.

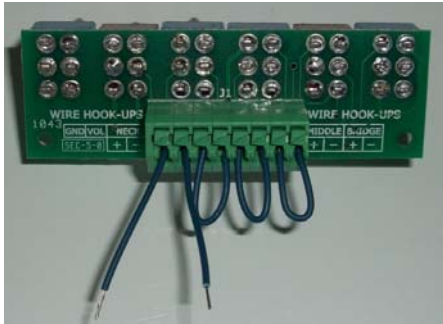
If you did not get the stated meter results, see the "Troubleshooting" section on the last page.

T3-BOARD: 3-PICKUP COIL BOARD TEST

Use this test procedure to validate correct operation of assembled T3-Board (or *KIT-T3*) product (*currently labeled "T-Board"*).

Use each of three 1.5" (3.81cm) blue wires to jumper the "+" to "-" hole locations on the green Terminal Strip for the [+]NECK[-], [+]MIDDLE[-] and [+]BRIDGE[-] pickup coils. Confirm that the ends of the wire are firmly gripped by the terminal strip by gently pulling on each wire. These temporary jumpers "simulate" pickups being connected to the PTM board.

Insert each of two 1.5" (3.81cm) long blue wires, one wire into the [GND] hole location, and the other wire into the [VOL] hole location on the green Terminal Strip. Confirm that they are firmly gripped by the terminal strip by gently pulling on each wire. Connect the ohmmeter leads to the [GND] and [VOL] wires that are attached to the Terminal Strip.



Here is what your T3-Board looks like with the wires attached.

For this test, the following switch positions are referred to as the **Start Position**.

Set switches SW1, SW2 and SW3 to off (center) position

Set switches SW4, SW5 and SW6 to *Parallel* (down) position

Note: open-circuit = no electrical connection,
close-circuit = electrical continuity (typically 0.7 ohms or less).



Shows which way is UP/DOWN with reference to the board.

Note: If you see a high resistance during testing for the "open circuit" state (e.g., in excess of 1 megohm) this is of no consequence. Your **Pickup Tone Multiplier™** switching system will perform as stated.

Place all switches into **Start Position**. Meter reads open-circuit.

Move switch SW1 up. Meter reads close-circuit. Move SW1 down. Meter reads close-circuit. Move SW1 to center.

Move switch SW2 up. Meter reads close-circuit. Move SW2 down. Meter reads close-circuit. Move SW2 to center.

Move switch SW3 up. Meter reads close-circuit. Move SW3 down. Meter reads close-circuit. Move SW3 to center.

Place all switches into **Start Position**. Meter reads open-circuit.

Move switch SW4 up to *Series* position. Meter reads open-circuit.

Move switch SW1 and SW2 up. Meter reads close-circuit.

Place all switches into **Start Position**. Meter reads open-circuit.

Move switch SW5 up to *Series* position. Meter reads open-circuit.

Move switch SW1 and SW3 up. Meter reads close-circuit.

Place all switches into **Start Position**. Meter reads open-circuit.

Move switch SW6 up to *Series* position. Meter reads open-circuit.

Move switch SW2 and SW3 up. Meter reads close-circuit.

Place all switches into **Start Position**. Meter reads open-circuit.

Move switch SW4 and SW6 up to *Series* position. Meter reads open-circuit.

Move switch SW1, SW2 and SW3 up. Meter reads close-circuit.

This completes the 3-pickup coil **Pickup Tone Multiplier™** board test. If you received the stated meter results, remove all the wires from the green Terminal Strip and proceed to the **Pickup Tone Multiplier Board Installation Instructions**.

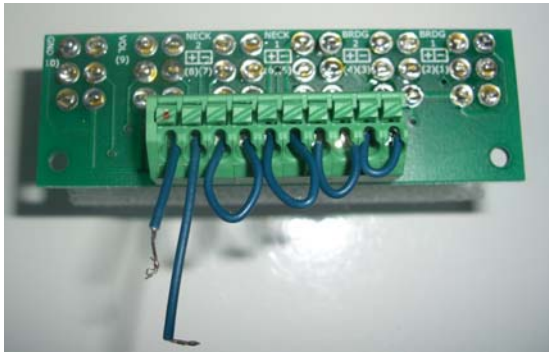
If you did not get the stated meter results, see the "Troubleshooting" section on the last page.

T4-BOARD: 4-PICKUP COIL BOARD TEST

Use this test procedure to validate correct operation of your assembled T4-Board (*KIT-T4*) product.

Use four 1.5" (3.81cm) long blue wires to jumper the "+" to "-" hole locations on the green Terminal Strip for the [+]NECK2 [-], [+]NECK1 [-], [+]BRDG2 [-] and [+]BRDG1 [-] pickup coils. Confirm that the ends of the wire are firmly gripped by the terminal strip by gently pulling on each wire. These temporary jumpers "simulate" pickups connected to the board.

Insert each of two 1.5" (3.81cm) blue wires, one wire into the [GND] hole location, and the other wire into the [VOL] hole location on the green Terminal Strip. Confirm that they are firmly gripped by the terminal strip by gently pulling on each wire. Connect the ohmmeter leads to the [GND] and [VOL] wires that are attached to the Terminal Strip.



Here is what your T4-Board looks like with the wires attached.

For this test, the following switch positions are referred to as the **Start Position**.

Set switches S2N, S1N, S2B, and S1B to off (center) position
Set switches S5N and S5B to *Parallel* (down) position

Note: open-circuit = no electrical connection,
close-circuit = electrical continuity (typically 0.7 ohms or less).



Shows which way is UP/DOWN with reference to the board.

Note: If you see a high resistance during testing for the "open circuit" state (e.g., in excess of 1 megohm) this is of no consequence. Your **Pickup Tone Multiplier™** switching system will perform as stated.

Place all switches into **Start Position**. Meter reads open-circuit.

Move switch S2N up. Meter reads close-circuit. Move S2N down. Meter reads close-circuit. Move S2N to center. Move switch S1N up. Meter reads close-circuit. Move S1N down. Meter reads close-circuit. Move S1N to center. Move switch S5N up to *Series* position. Move both S2N and S1N up. Meter reads close-circuit.

Place all switches into **Start Position**. Meter reads open-circuit.

Move switch S2B up. Meter reads close-circuit. Move S2B down. Meter reads close-circuit. Move S2B to center. Move switch S1B up. Meter reads close-circuit. Move S1B down. Meter reads close-circuit. Move S1B to center. Move switch S5B up to *Series* position. Move both S2B and S1B up. Meter reads close-circuit.

This completes the 4-pickup coil **Pickup Tone Multiplier™** board test. If you received the stated meter results, all the wires from the green Terminal Strip and proceed to the **Pickup Tone Multiplier Board Installation Instructions**.

If you did not get the stated meter results, see the "Troubleshooting" section on the last page.

TROUBLESHOOTING

General Information

Note: If you did not get the stated meter results, inspect your wiring and identify any incorrect connections to the Terminal Strip. Confirm that the test jumper wires are actually connected (being firmly gripped) inside the Terminal Strip. Also inspect the printed circuit board solder connections to verify there are no “cold” or unsoldered connections. If everything appears to be correct, a switch is defective. Replace the switch with another. The switch is commonly available at Radio Shack and elsewhere. **We only warranty and replace defective switches that have not been soldered.** Checking switches prior to assembly is required prior to kit assembly and is specified in the assembly instructions on page 2 under “Switch Testing”.

T2-Board Help

(to be added at a future date)

T3-Board Help

(to be added at a future date)

T4-Board Help

(to be added at a future date)

General Help

High resistance reading where it should read open-circuit:

Quickly cycle switches dozens of times. This may reduce resistance issue. High resistance is frequently caused by using excessive solder and excessive heat. Solder flux is able to migrate into the switch body causing this issue. When the switch is cycled repeatedly, the issue will generally subside or disappear. If you see a high resistance during testing for the “open circuit” state (e.g., in excess of 1 megohm) this is of no consequence. Your **Pickup Tone Multiplier™** switching system will perform as stated.