Troubleshooting Spengler Link, Spengler Sound and a Pack Lights board.

*** always turn the battery off when changing wires or cables ***

Step 1, Spengler sound board

1) Make sure you have a fully charged battery.
2) The Sound Board should only have the battery and speaker cables connected to it. All other cables should be removed.
3) The shorting jumper should be removed from SEL3 (just a holding place, it does nothing) to SEL1. It should short the two SEL1 pins together when installed. This will place the sound board in a test mode. We do this since this will cause the sound board to make sounds.

*** If the battery is wired backwards, it can damage the boards. Make sure the battery wires are correctly attached before powering on the battery ***

4) Turn on the Battery
5) The sound board should have a dim red LED come on.
6) The sound board should announce “TEST one Four TEST” (or whatever software revision is loaded into the board), the “one” over and over for as long as the jumper is on SEL1.

*** If you do not hear “TEST”, make sure the jumper is fully seated on SEL1. THe volume defaults to a low-mid level without the volme control plugged in. Not very loud, but should be audible.

If you still do not hear anything, it would be good if you have a music player that you can plug into the Audio in jack. This is a direct path to the audio amplifier so should be able to play through the audio amplifier anytime power (and a speaker) are connected to the sound board. ***

7) Turn off the battery, plug in the volume control potentiomer cable and then turn the battery back on.
8) Adjust the volume level with the knob to make sure the volume settings can be adjusted.
9) Turn off the battery and place the jumper back on the SEL3 posts for safe keeping

This should verify that your sound board is capable of making sounds.

Step 2, Power Cell and Cyclotron lights (Pack Lights)

1) Turn off the battery.
2) Plug the cyclotron cables into the cyclotron boards and the powercell board.
3) Plug the vent light (2 or 3 wire cable) into the vent connector on the powercell board
4) Plug the ribbon cable between the sound board and the powercell board. Make sure it is fully seated.
5) Adjust the powercell “CONFIG” trimmer pot to a 1/3 or 2/3 position. Adjust it gently, it is made of plastic.
6) Turn on the battery.
7) The power cell lights should come on and start cycling.

*** if the lights do not start sequencing, you can still “force” lights to come on by going into the PackLights test mode. Rotate (gently) the CONFIG trimmer to the fully clockwise or counterclockwise

position. If the lights still do not come on, then there may be an issue with the ribbon cable. Make sure it is fully seated on both ends.

You can also try powering up the Pack Lights separately by turning off the battery, removing the ribbon cable between the sound board and the Pack Lights powercell board and connecting the battery directly to the screw terminals on the powercell board. BE VERY CAREFUL connecting the turned off battery. If the battery is connected backwards it can damage the board. ***

8) The sound board should be quiet.
9) You can test the pack lights by adjusting (carefully) the trimmer to the full counterclockwise or clockwise positions. This will light up all of the LEDs and show the different colors of the cyclotron lights.
10) When done, adjust (carefully) the CONFIG trimmer to a speed that is desired. See the Pack Lights instructions for additional details about what configurations are possible.

This should verify that your pack lights are operating properly

Step 3, Spengler Link and Wand

1) Turn off the battery.
2) Plug the 4 wire cable in an 8-pin housing into the sound boards 8 pin "Wand Lights" connector. This cable is used to power the Spengler Link and the wand.
3) If you are not going to power the Spengler Link and wand from the Sound board, this cable will not be used and you need to load in fresh batteries into the Spengler wand.
4) Turn on the Battery (connected to the sound board)
5) The Wand should now be able to power up and behave just like it did before you added the Spengler Link board. Verify that all operation in the wand still work: power up down, firing, changing modes, adjusting the intensity of firing.

*** If you are powering the wand from the Sound board and the wand will not power up, check the 4-wire cable and make sure it is fully seated in both the 8-conductor sound board connector and the 4-pin connector in the Spengler Link ***

6) Power down the wand (all toggle switches in the down position).
7) Go through the Spengler Link test sequence detailed in the Spengler Link instructions. Located at page 48 in the current (as of this writing) instructions.

*** lots of Spengler Link debug help in the instruction ***

8) Once you have completed the testing of the Spengler Link and pass the tests, you need to remove at least one of the jumpers so the board will not continue in test mode.
9) Remove the batteries from the wand (if they were powering the wand) and turn off the battery to the sound board. This will make sure we start our next test with the boards ready to operate and not be in test mode.
10) Place all of the Spengler Wand toggle switches in the down position so the wand will be off and in a good initial starting position.
11) Add the 3.5mm stereo audio cable from the Spengler Wand jack (connected to the Spengler Link) to the "Wand" 3.5mm jack next to where the Pack Lights ribbon cable is connected. Do

not plug it in to the “Audio” jack on the other end of the sound board, as this will not allow the wand to control anything.

12) Replace the batteries in the wand (if used) and turn on the main battery.
13) The Pack Lights should stay off.
14) The Sound Board should be silent and the red LED on the sound board should come on.

*** If the pack lights come on at this point, then the sound board is not seeing the Spengler link. This is looking at the signals on the 3.5mm audio cable. Check the cable and also verify the wiring on the connector. If the signals are swapped, the sound board will not know that the wand is attached. Also make sure the 3 wire connector is fully plugged into the Spengler Link board ***

15) Turn on the wand (lower toggle switch on the front face of the wand to the up position.)
16) The wand should turn on.
17) The wand’s startup sound should come from the wand and the speaker that is connected to the sound board.
18) The Pack Lights should start-up and start sequencing.
19) Turn the wand off (lower toggle switch on the front face of the wand to the down position.)
20) The wand should shut down.
21) The wand should play a shut-down sound that comes through the wand and the speaker that is connected to the sound board.

Step 4: Additional Spengler Link Audio Cable tests if the pack lights are not responding

1) Plug the 3.5mm audio cable from link into the “Audio In” jack on the sound board. This is the jack that is normally only used for music players and is located on the same end of the board as the speaker is connected. This is only for test since the control signal will not be seen by the microcontroller on the sound board.

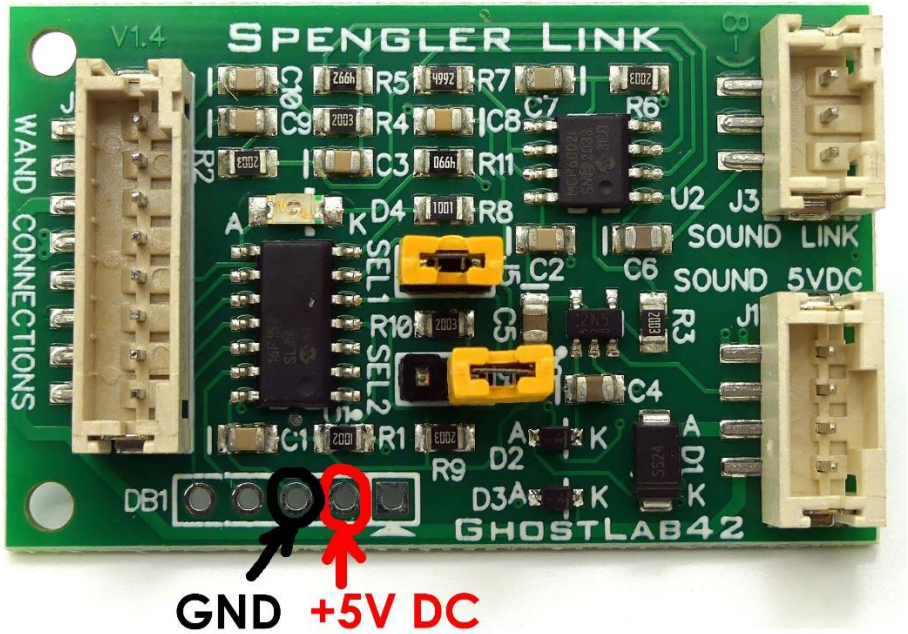
2) With the sound board powered and the wand in a powered down state, you should be able to hear a “clicking” sound in the sound board’s speaker. This is the control signal from the Link but is now being treated as an audio signal because we are using the other jack on the sound board.

3) Now power up the wand, the power up sound should play and the clicking should stop. This test should verify that both the sound and the control signal from the Link are connected to the audio cable.

4) Move the 3.5mm stereo audio cable back to the jack on the sound board marked “Wand”. Test to see if the wand sounds are still able to come out of the sound board’s speaker. If they do not, the Red and Green wires that you soldered to the audio jack in the wand are probably swapped.

Measuring voltages

If you have a voltmeter or DMM, you can measure the DC voltages of the battery and also the 5V regulators on the boards.





A connected setup:

