

**CAUTION:** Even when using a heat sink, prolonged application of heat to the solder joint of a semiconductor component could damage or destroy the device.

33) Spread a small amount of flux at the three solder joints of Q1 and **quickly** solder the transistor into position. Remove the heat sink and trim the leads of Q1.

**NOTE:** A through-hole integrated circuit (IC) contained in a dual in-line package (DIP) is not soldered directly into a PRESSON Circuit Modules PCB. Instead, it is inserted into a DIP socket that has been soldered into the PCB. DIP1 is a 14-pin DIP socket that will hold integrated circuit U1, a dual general-purpose timer. In the event of failure of an integrated circuit on a PRESSON PCB, having the DIP socket on the board allows easy removal and replacement of the IC. Also, not having to hand solder a through-hole IC directly into a PCB avoids damage that could be caused by excessive heating. As indicated in Figure 9, the notched side of the 14-position DIP socket should be aligned over the notched end represented in the silk-screening for U1.

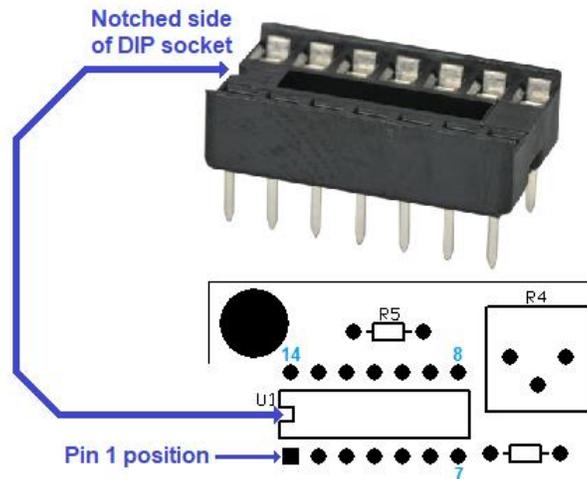
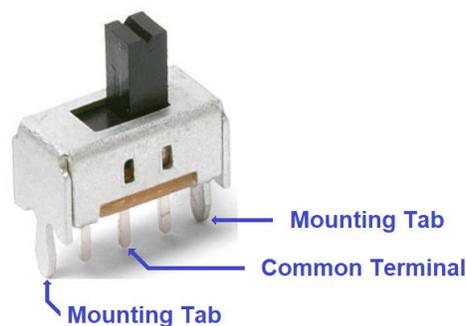


Figure 9

34) Remove DIP1 from its packaging and, using Figure 9 as a guide, insert it into the U1 position of the PCB.

35) After inserting DIP1 into the board, secure the component in place with painter's tape and invert the PCB. Spread a small amount of flux at the fourteen solder joints of DIP1 and solder it into position.

**NOTE:** SW1 is a single-pole/double-throw (SPDT) miniature slide switch, the purpose of which is to enable or disable operation of audio transducer PIEZO1. Because of the proximity of the three switch contacts and two mounting tabs of SW1, soldering this component into position could be the most challenging task in this assembly procedure. Before soldering this component into the board, ensure the soldering iron tip is clean and free of excess solder. (The solder resist coating on the ground plane layer of the PCB should help greatly in preventing solder bridges.) Because, as shown in Figure 10, the common terminal of SW1 is its center pin, the switch can be mounted into the board in either direction.



**Figure 10**

36) Remove slide switch SW1 from the Flasher/Audio Alert kit package. Using Figures 1 and 2 of the Tables and Figures as a guide, insert SW1 into position.

37) Place a small strip of painter's tape across the top SW1 of the PCB to ensure it stays in the fully inserted position. Apply a small amount of flux to the five solder pads and solder the switch into position. View the solder joints of the switch using the Helping Hands magnifier and perform a solder bridge check.

38) Remove the completely assembled Flasher/Audio Alert module from the helping hands. Viewing the ground plane side of the board under the magnifier, carefully inspect the board for solder bridges, small specks of splashed solder, or excess flux.

**NOTE:** Both sides of the Flasher/Audio Alert module (other than the surfaces of pads and vias) are coated with **solder resist (or solder mask)**. This allows tiny specks of solder to be removed easily from the green-tinted areas of the PCB surfaces.

39) Remove the completed Flasher/Audio Alert module to a well-ventilated area. Clean the board surfaces using the flux remover aerosol can and brush.

**CAUTION:** It is easy to bend or break the pins of a DIP IC when inserting it into its socket. Be sure that all fourteen pins of U1 are properly aligned over their dual leaf sockets before applying pressure. **Apply pressure slowly and evenly while inserting the IC.**

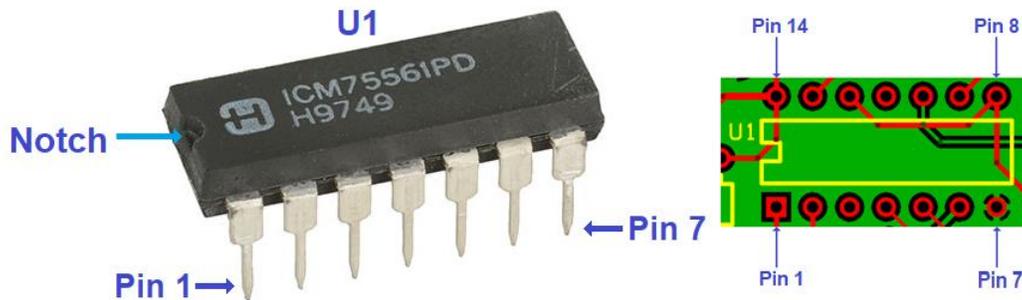


Figure 11

40) Referring to Table 3 of the Tables and Figures sheets, remove dual general-purpose timer U1 from the Flasher/Audio Alert kit package. Using Figures 11 as a guide, **CAREFULLY** press U1 into its socket.

### Conclusion:

If you have performed the above assembly procedure carefully, and checked all your soldering work, then the Flasher/Audio Alert Breadboard Module should operate correctly when power is applied. Before applying power to the module, we strongly suggest the student carefully read through the [Flasher/Audio Alert Module User's Guide](#). This document will provide the user with a fundamental knowledge of the operation of the module.

### Flasher/Audio Alert Module Quick Test:

Figure 12 illustrates a preferred method of connecting the Flasher/Audio Alert Module for a quick operational test. As shown here, right-angled header J1 is connected into a breadboard strip, with the +5.0VDC bus connected to pin 1 and the ground bus connected to pin 3.

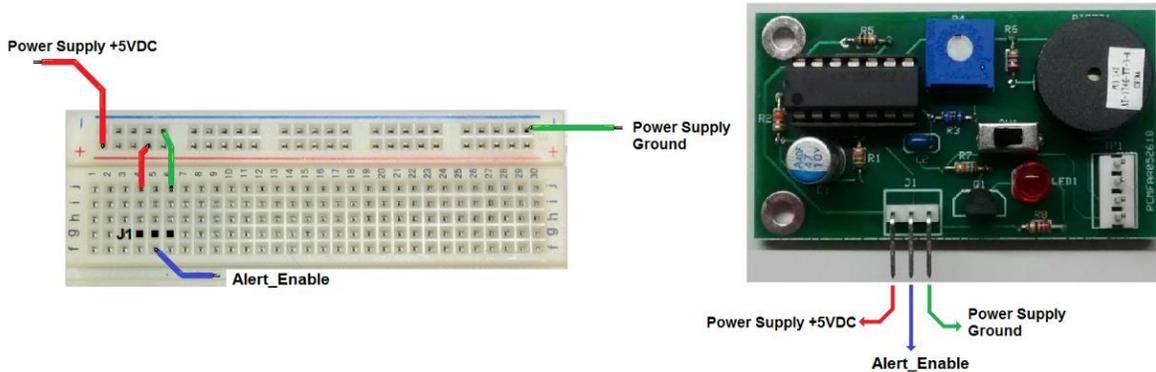


Figure 12

If a +5.0VDC power source is not available, three AA batteries can be placed in series to provide a temporary DC source of around +4.5VDC as shown in Figure 13. This voltage is adequate for testing a breadboard module designed to operate from a +5.0VDC source. The Keystone three-position AA battery holder can be purchased from Mouser Electronics (stock number [534-2487](#)).

**CAUTION:** Use only a +5.0VDC source or the +4.5VDC alternative source to power the Flasher/Audio Alert Module. Connecting a 9V battery directly to pins 1 and 3 of J1 could damage the board!



Figure 13

- 1) Insert the Flasher/Audio Alert Module into the breadboard section as shown in Figure 12.
- 2) Ensure slide switch SW1 is actuated to the right-hand position.



3) While leaving the blue Alert\_Enable wire disconnected, apply power to the module. LED1 should now begin to flash at a rate of nearly once per second.

Does LED1 flash at this time?

YES/NO

If LED1 does not flash, a possible problem could be the incorrect orientation of LED1.

4) Using an alignment tool or a small flat head screwdriver, adjust the wiper of trimmer R4 as necessary to align the groove of the white actuator in the vertical position, as seen in Figure 12.

**NOTE:** Vertical alignment of the actuator of R4 should allow Piezo1 to vibrate at nearly 4KHz (the resonant frequency of the device.)

5) Actuate slide switch SW1 to its left-hand position.

Does PIEZO1 beep while LED1 is illuminated?

YES/NO

If PIEZO1 does not sound at this time, verify that U1 is seated properly in its DIP socket. Also verify that SW1 has been soldered properly.

6) Adjust the wiper of R4 as necessary to achieve the clearest and most resonant tone from PIEZO1.

7) Bring the Alert\_Enable signal to a logic low (0V) by connecting the free end of the blue jumper wire to the circuit ground bus.

Does this action inhibit the operation of the circuit module?

YES/NO

8) Remove the blue jumper wire from the ground bus.

Does this action enable the operation of the circuit module?

YES/NO

If you answered YES after steps 3, 5, 7 and 8 of this Quick Test procedure, then the Flasher/Audio Alert Breadboard Module is functioning properly and is ready for use in subsequent lab exercises and design work!