

Halloween Pumpkin Project with XBee

Level: Intermediate

Hours to Complete: 2 - 3

Skills Required: Reading Schematic Diagrams, Soldering, Propeller (SPIN) Programming, and some Assembly



This project expands on the previous Halloween Pumpkin Project with the addition of XBee Modules. The added XBee Modules allow remote triggering of a second pumpkin. Two identical-built Halloween Pumpkin Projects are required for this expansion project. If you haven't built them yet, check out the original Halloween Pumpkin Project included in this download for detailed instructions.

Once this project is finished, your Pumpkins will be able to trigger each other so that they play their WAV file in unison. Optionally you can disable one, making the other the master so that one will always trigger both.

What's Needed

- (2) - Completed Halloween Pumpkin Projects
- (2) - XBee Adapter Board (#32403)
- (2) - XBee 1mW Wire or PCB Antenna (#32405) or (#32404)

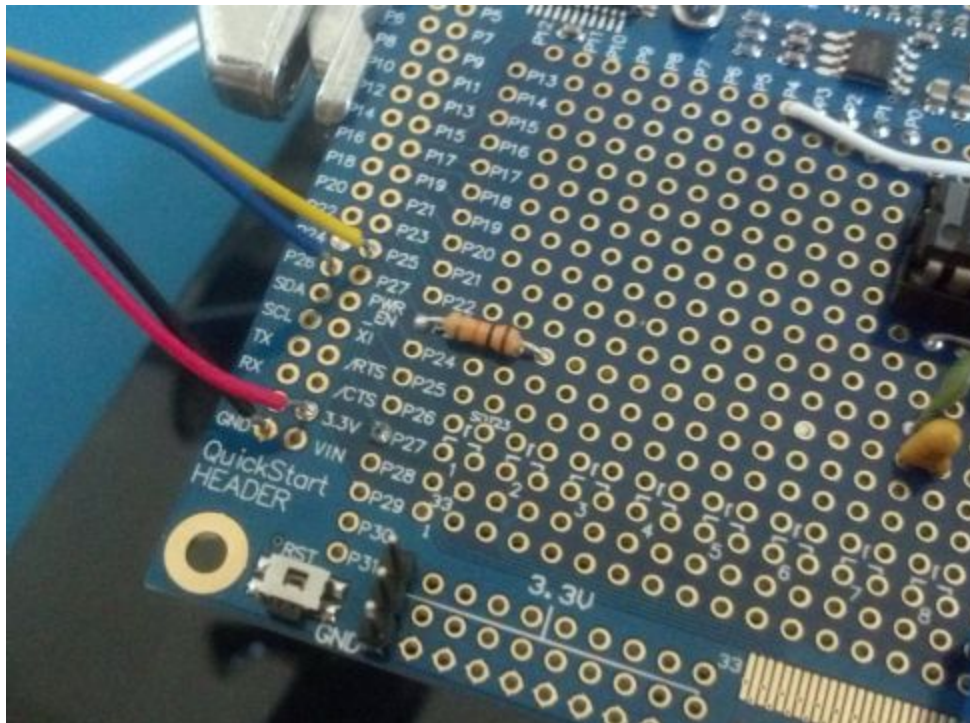
Optional Components:

- 1/4" Standoff (for mounting adapter board)
- 22 gauge solid wire
- XBee USB Adapter Board (#32400) only needed if you want or need to configure your XBee modules.

Setup the XBee Connections

- ✓ To add XBee capability to your two Halloween Pumpkins, start by accessing the Propeller Project Board.

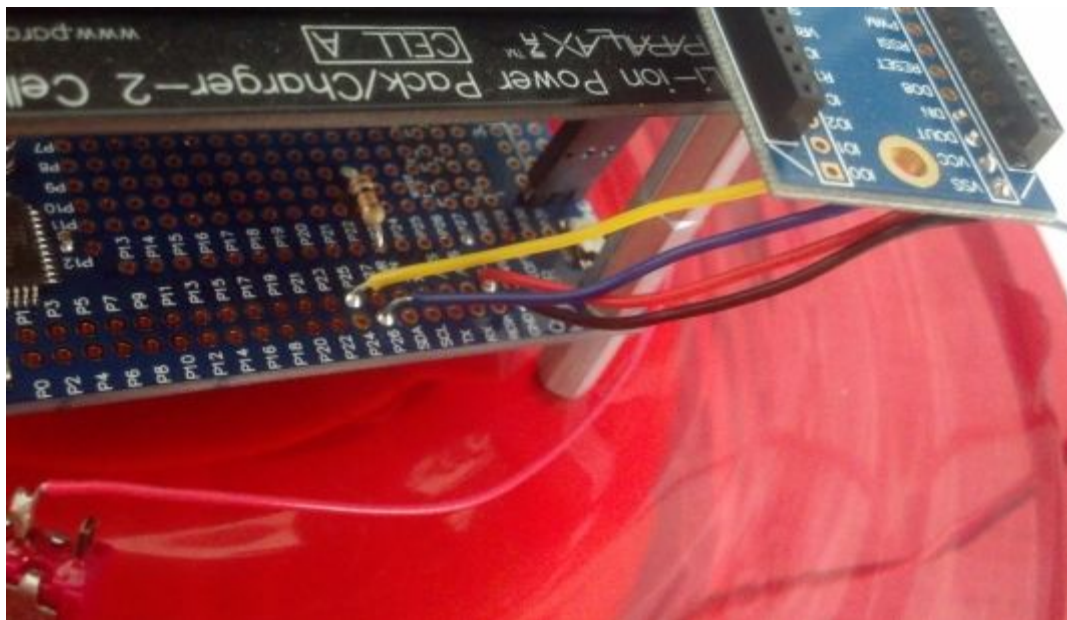
If you're adept with a soldering iron you may be able to get away with just removing the Li-Ion pack to get it out of your way. If not (or if you're not sure how), just temporarily remove the Propeller Project Board completely from the project so you can attach 4 wires as shown:



These wires connect as follows; refer to the schematic if needed:

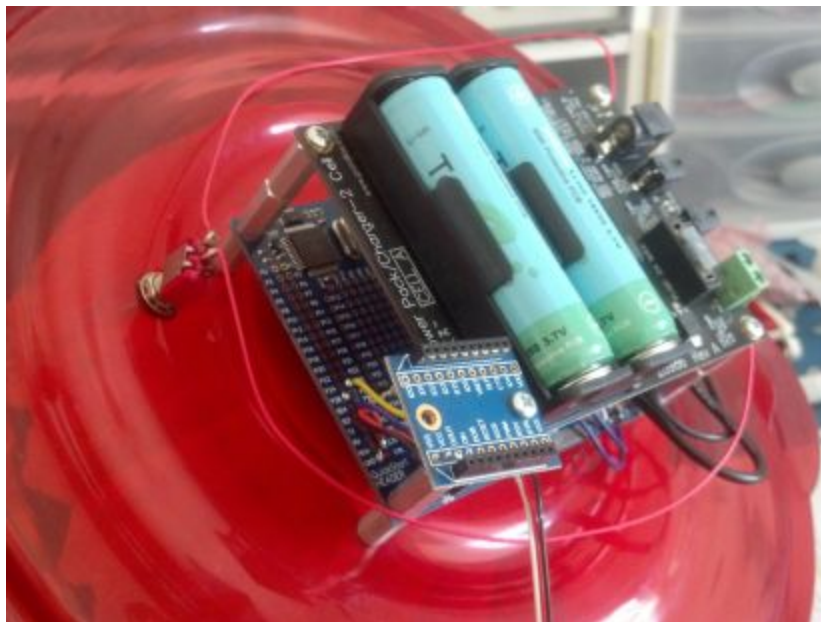
- GND (Black) on the QuickStart connections to GND on the XBee Adapter Board.
- 3.3V (Red) on the QuickStart connections to VCC on the XBee Adapter Board.
- P26 (Blue) on the QuickStart connections to DOUT on the XBee Adapter Board.
- P25 (Yellow) on the QuickStart connections to DIN on the XBee Adapter Board.

As you can see from the photo we use the first 4 holes on one side of the XBee Adapter Board.



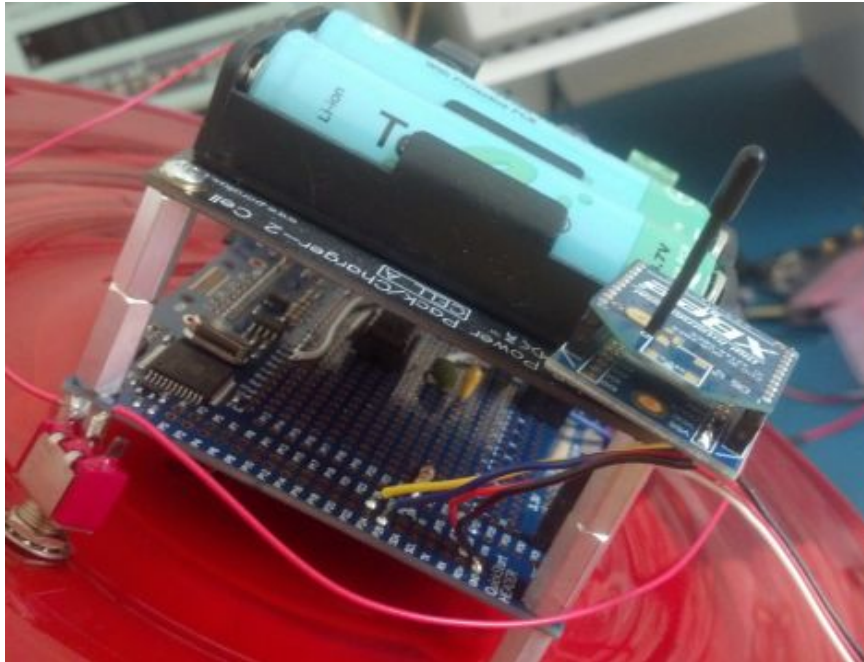
- ✓ Now we can re-install the boards and secure the XBee Adapter Board to the Li-Ion Power Supply.

In my case, I removed one of the screws holding the board and replaced it with a 1/4" Hex Standoff and then used the screw to secure the adapter board to the standoff.

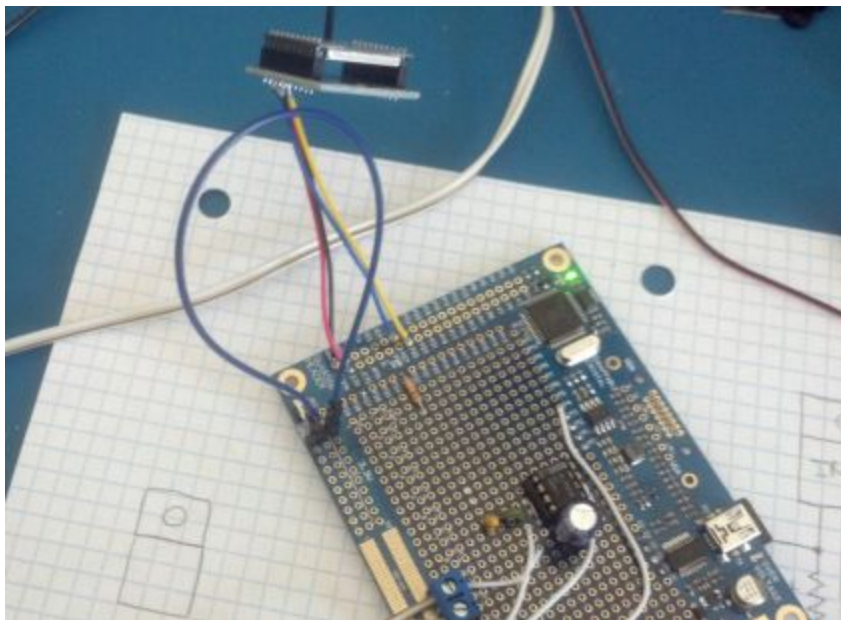


- ✓ Once the XBee Adapter Board is secure you can install your XBee Module.

The XBee Modules shouldn't need any configuration, however if you wish to configure them or customize their settings you should do that using the optional XBee USB Adapter Board (#32400) prior to installing them.



There is one optional feature you can set up when putting the pumpkins back together. If you only want one pumpkin to be a trigger for motion, then on the other you should tie a jumper wire between the GND and signal pins of the PIR header as shown in the photo below.



What this will do is disable the motion sensing for that pumpkin, making the other pumpkin the trigger/master. Be sure to tie the two outer pins together and not the middle (power) pin.

Code Modifications for XBee

- ✓ Load the updated code (from the project download) onto the Propeller Project Board and set your pumpkins up.

If you've left the PIR sensor connected on both pumpkins, when either of them senses motion they will both play their sound file at the same time. If you've tied the PIR input low on one, that one will become the remote and the other will be the master used to trigger both. This means that only the master will be able to trigger both of the pumpkins to play sound.

This can be good if you have a walkway leading up to your porch and you have one pumpkin down the walkway and one on the porch. When the one on the walkway detects motion, they will both trigger, but the one on the porch will not trigger any sound from either pumpkin.

What Changed From the Original Project?

The only change to the schematic is the addition of the XBee modules and the 4 connections they require. The only change to the code is the addition of the serial object and the code to handle sending and receiving the play command packet over the XBee modules.

If the pumpkin senses motion via PIR it will send the play command packet out over the XBee radio and then play the WAV sound, wait 6 seconds and be ready again. However if a pumpkin receives a play command packet it will play the WAV file and then go back to waiting for the next event.