1. Had to power light organ from the receptacle next to the downstairs work bench to avoid noise getting on the audio speakers (used the long orange extension cord). Also had to make sure the audio line going to the light organ (the one without filters on the ends) was not crossing over any servo wires or the extension cords from the light organ to the flood lights. Get another filtered audio line to use from the PC to the light organ to reduce or eliminate this problem or use some type of isolation scheme (optical?). Also the jack on the light organ was a little flakey and required the plug to be slight pulled out to work so need to work on that too.
2. Need to get the use of full program memory addressing (32 bits) working so that can switch between several device player arrays on the fly without having to conditionally recompile out the ones you don’t want because they exceed the 64K limit.  
   **Done**: Added a new array values reader object with derived classes to read from program memory, and pointer memory with a base class overridden read function that has an index as a parameter. Thses get instantiated and setup and then passed to the player when the device is registered.
3. Didn’t use the air cylinder this year so not sure if that’s working ok still.
4. Get the mouth servo wire on a quick connect/disconnect plug like all the other connections at the prop
5. Look at replacing the bottom half of the eye LEDs connection wire from the head with the 3 line servo wire to make it more flexible.
6. Check to see if can use the aluminum servo hub in place of the plastic one on the mouth servo although the plastic one seemed work ok
7. See if can get some swing point on the left side of the mouth connected to the head to provide more support as didn’t use the backup/down in 2018.
8. Get the foscam web cam working sooner as couldn’t get it to work in 2018
9. Get the IMUs hooked up to a head gear mechanism to easily slide on and off the head, including making a mouth mechanism for tracking mouth movements. Also have a way to feed mic audio to the prop so that can do live interactive prop operation (use the web cam as the eyes and ears to see and hear what’s going on, and the mic for talking and the head gear for head and mouth movement
10. See if there is some way to make a skin cover for the bottom of the mouth to the neck to cover up the servos and make it look better.
11. See if there is a way to limit the head from completely bending over where the chin hits the neck pvc pipe, when the servos are not powered. Possibly use a spring that has a little give and then attach it along with some slack wire to the center of the vertical servo metal connection so that when that servo is holding the head at 160 degrees or 20 degrees the slack/cable is completely taught and starts to pull on the spring. If the spring has a little give it can cushion the head when it drops from 90 degrees to those positions.
12. Have the servo device class have a method that limits the servo setting to provide a better way to limit this in one place (possibly in the base device class so every one inherits it)
13. See if can also have the prop audio go to the loud speakers (although the prop speaker did seem to be loud enough)
14. Have light shining on the vampire prop itself to make it more visible as people can stand in the way of the porch light that is the only light on it now.
15. Didn’t use the wood base in 2018 as didn’t use the back up/down but had a problem trying to fit the prop into it and ended up not using it?

Enhancements -

1. Making the prop skeleton arm move with servos : one for the hand, up/down two for the lower part of the arm (up/down and twist) and two for the upper part (up/down and horizontal rotation side to side) where the upper part would need to be geared to get the force needed to lift the arm or a really strong servo. Want the arm to move at a decent natural speed. Would need another 2 IMUs for choreographing for this (already have one but having a spare is always a good idea). It appears that should be able to have another 9 servos that the Arudino Mega can control by using 16 bit Timers 3,4,5 (3 servos for each timer and timer 1 already used for the 3 existing servos)) which currently no other arduino mega packages I use actually use, or plan on using use, as far as I can tell by searches. See the Atmega2560 datasheet for any difference in using those from timer 1 (17.2 Overview and on in that datasheet). Would need to modify the PWMServo package to use these additional timers. Optionally there is a adafruit shield that uses I2C that can control a massive number of servos ( it is 14 bit instead of 16 bit but that should be good enough for 1 degree changes). I2C should be fast enough even to command 9 servos every 50 milliseconds.
2. See if using some type of motor instead of the air cylinder would work for back up/down as it would be easier to control the stopping speed than the elastic cord mechanism we have now with the air cylinder. The only issue would be the speed it could achieve and the toque it can produce (has to be at least as quick as the pneumatic cylinder). Or if there is a way to more accurately slow down the pneumatic cylinder at the end points.