Robbie Ivey Project – College Dorm - Detailed view (v1)

By Bill Weis

Review of the Requirements for this project and the high-level design of the solution

Robbie Ivey – Duchenne Muscular Dystrophy

Requirements:

1. Be able to voice control his bed (Assured Comfort with a Linak HB22 wireless remote)

2. Make phone calls

3. Watch NCIS on Netflix and other Netflix Programs as well as Youtube

4. Watch programs on the campus version of xfinity

5. Be able to navigate the Roku by voice and select programs

6. Control the lights in his room – turn on/off and dim
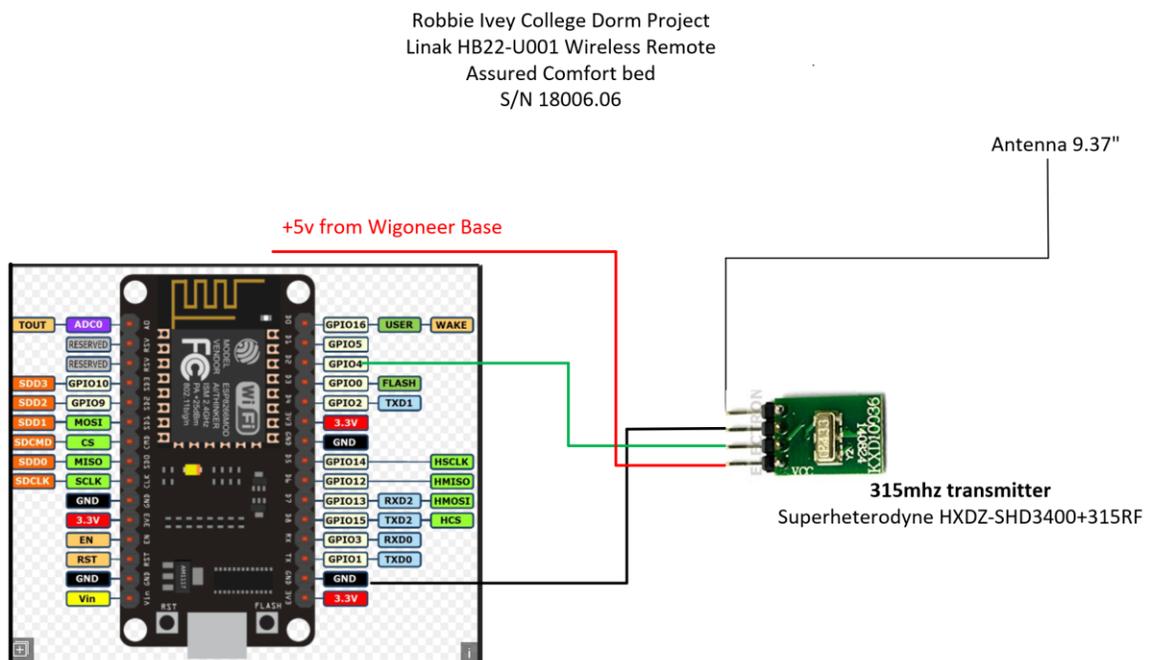
7. Turn a tower fan on/off

Solution – High Level:

1. Installed an Amazon Echo, a Google Home Mini, and a custom developed bed controller to allow Robbie to control his bed using voice commands from either smart speaker

2. Updated the Google Gmail contact list with those names Robbie will want to call

3. Installed a Google Home, Chromecast Ultra and a Logitech Harmony Hub to enable Robbie to watch his NCIS program on Netflix

4. Use Google Home and the Logitech Harmony Hub and the Roku Streaming stick to enable Robbie to watch programs on the campus version of xfinity

5. Use the Google version of Quick Remote to enable Robbie to navigate the programming on the Roku stick by voice, specifically the campus version of xfinity

6. We installed WeMo Mini WiFi Smart plugs for voice control of two lamps

7. We installed a WeMo Mini WiFI Smart plug to give Robbie control over his fan

Details of the Solution

1 – Voice Control his bed – v2 of Robbie's voice activated bed controller for his Assured Comfort bed is a big step forward from his prototype bed controller we developed 15 months ago. We were able to program the ESP8266 microcontroller to transmit the same signal that the HB22 remote would send, allowing for a much simpler design.

Also, a significant bit of progress that was made since Robbie's prototype bed controller from the fall of 2017 was the release of the Limited Mobility Solutions – Multi Device skill developed by our colleague John Hollcraft. John developed the Amazon skill early in the summer of 2018. Just prior to moving Robbie to his college dorm room, Google approached us asking if they could shoot a short documentary on the use of technology and how that made it easier for Robbie to leave home and attend college. Of course, Google made the request that in their video, we show our custom bed controller being controlled by Google commands, and John Hollcraft developed a Google Service – Limited Mobility Solutions. The real beauty of John's design is that a single bed controller with no modifications can be voice controlled by either Amazon or Google. (and actually, by both smart speakers). We have seen at times where either Amazon or Google may apply a system update which results in a short outage of their service. John's design enables higher availability of our voice activated bed controller where our customer can control the bed from the Google mini, and if there is an outage with the Google service he/she could control the bed from Amazon, or visa versa.

Robbie Ivey College Dorm Project
Linak HB22-U001 Wireless Remote
Assured Comfort bed
S/N 18006.06

Antenna 9.37"

+5v from Wigoneer Base

315mhz transmitter
Superheterodyne HXDZ-SHD3400+315RF

2. Make phone calls

Since Robbie is now living in a dorm room away from home, he wanted to have the ability to call certain people, and that required the simple task of adding those names and phones numbers to Robbie's gmail contact list. With Google, you can speak the number to call, or you can call the person by name if their name appears in your Google contact list. Here is one of the resources for setting up phone calling with Google Home. For more information, you can search the internet for more articles or YouTube videos.

3. Watch NCIS on Netflix and other Netflix Programs

Keep in mind that everything must work by issuing voice commands only. In my lab, I performed testing with an Amazon Echo/Roku/Harmony Hub combination and found that the easier solution is to use Google with a Chromecast Ultra/Harmony Hub combination to make it possible for Robbie to watch his Netflix and Youtube videos. The challenging part was the fact that Google only supports one Harmony Hub and Robbie needs to have voice control over two TVs.

- Bedroom TV Vizio D32h-F0
- Livingroom TV Vizio D43f-F2

Since the two TVs are in different rooms, it was not possible for Harmony to send signals to both TVs, so we added a Interset wireless IR repeater to extend the IR signal to the distant TV. This product has a small device that you place at the Harmony Hub, and a device you place at the distant TV. It works by converting the IR signal sent by the Harmony hub to RF (which can travel a greater distance), then at the distant TV it converts from RF back to IR. There was one complication to this. Both TVs are Vizio TVs that could be controlled by the same hand held remote. This would mean that if you give a command to control the Living Room TV, the bedroom TV would also receive this signal. So, for the scenario where Robbie is in his bedroom watching a program, and his care giver is in the living room watching a different program, we wanted the ability to turn off the extender. We solved this problem by installing a WeMo switch, which allows Robbie to issue a Hey Google, Turn Off IR command.

4. Watch Campus version of xfinity

Oakland University like many universities have implemented the campus version of Comcast's xfinity, which is a streaming service. The Roku streaming stick was installed as the way for Robbie to access the xfinity programming.

5. Voice Controlled navigation of the Roku Streaming stick

For Robbie to be able to watch programs on xfinity, he must be able to launch the tv program by voice. Quick Remote is an app that currently only runs on android devices, but it gives Robbie the ability to navigate the Roku streaming stick by voice and select and watch a specific tv program. The app costs roughly $10 per year. Here is a link showing Robbie using Quick Remote with xfinity. (If you get a windows security window, login or hit cancel to see the video)

6. **Control the lights in his bedroom and living room**
   In Robbie's dorm room, there is a lamp in his bedroom and a lamp in the living room. Each lamp is controlled by a WeMo Smart Mini switch enabling Robbie to turn on/off each lamp with voice commands through the Google Home Mini.

7. **Turn a fan on/off**
   Robbie has a fan in his room, and likes to run it from time to time on warm days. To enable him to turn the fan on and off by voice, we installed a WeMo Mini WiFi Smart Plug. For guidance on how to install a WeMo Mini Smart Plug, go here or search YouTube for examples.

We will add a link to the Google short documentary fimed during this project when it becomes available.

Resources
Amazon Echo
Alexa Support (Contact Support via the Amazon Alexa app - can have them call your number)
Google Home getting started
Google Home Help Forum
Google Home Support   Phone number for Google Home hardware support = 855-971-9121 (24/7 days a week)
Logitech Harmony Knowledge Base
Logitech Harmony Support Phone # for Support = 866-601-5644 (M-F 8am to 6pm PST)
Lifx
Wemo Support Phone number for Support = 1-844-745-wemo (9366)