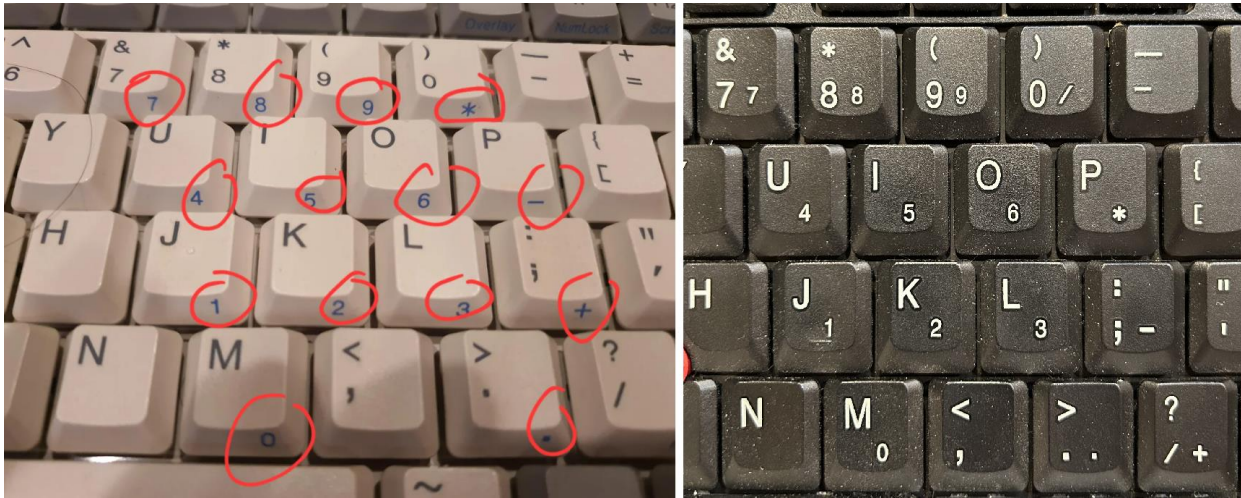Embedded Number Pad

When you press the NumLock key on the keyboard, it sends the Num Lock HID code to the host over USB. The host does not automatically translate the letters on the embedded number pad into numbers because keyboards differ in which keys are used. The host provides a byte called keyboard_leds and bit D0 will be high if Num Lock has been enabled. The Teensy code can watch this bit and switch to a new number pad matrix when it's set. The Sony Vaio P code at my repo is a good example to explain the process.

Step 1 – Copy the Normal key matrix and Paste it just below (see lines 47-63 in the example code). Call this new matrix "numlock". In the new numlock matrix, find and replace the normal key name with the number pad name. For example, change KEY_7 to KEYPAD_7. Here are all the possible key pad names:

KEYPAD_SLASH, KEYPAD_ASTERIX, KEYPAD_MINUS, KEYPAD_PLUS, KEYPAD_ENTER, KEYPAD_1, KEYPAD_2, KEYPAD_3, KEYPAD_4, KEYPAD_5, KEYPAD_6, KEYPAD_7, KEYPAD_8, KEYPAD_9, KEYPAD_0, KEYPAD_PERIOD

Step 2 – Whenever a normal key is pressed, check if numlock is turned on (see lines 355 – 362 in the example code). If it is turned on, send the numlock key name instead of the normal key name.

if (keyboard_leds & 1) { // test if Num Lock is turned on. If it is, then send the num lock name

　　load_slot(numlock[x][y]); //update first available slot with key name from numlock matrix

　　send_normals(); // send all slots over USB including the key that just got pressed

}

else {　　　　// Num Lock is not turned on so send the regular name

　　load_slot(normal[x][y]); //update first available slot with key name from normal matrix

　　send_normals(); // send all slots over USB including the key that just got pressed

}

Step 3 – Whenever a normal key is released, check if numlock is turned on (see lines 373-379 in the example code). If it is turned on, clear the numlock key name instead of the normal key name.

```
if (keyboard_leds & 1) {  // test if Num Lock is turned on. If it is, then clear the num lock name

    clear_slot(numlock[x][y]); //clear slot with key name from numlock matrix

    send_normals(); // send all slots over USB including the key that just got released

}

else {          // Num Lock is not turned on so clear the regular name

    clear_slot(normal[x][y]); //clear slot with key name from normal matrix

    send_normals(); // send all slots over USB including the key that just got released

}
```

Step 4 – This step is not essential but it eliminates confusion. If the host computer already has Num Lock enabled when you plug in the Teensy keyboard, you will get numbers instead of letters for the keypad keys. To turn off Num Lock when the Teensy is first powered on, add the following code in setup after line 308.

```
delay(1000); // wait 1 second to let the Teensy receive keyboard_leds byte from the host

if (keyboard_leds & 1) {  // test if num lock is On. If it is, turn it off.

    Keyboard.press(KEY_NUM_LOCK); // Press the num lock key to de-select it

    delay(5); // delay 5 milliseconds before releasing the key

    Keyboard.release(KEY_NUM_LOCK); // Release the num lock key

}
```