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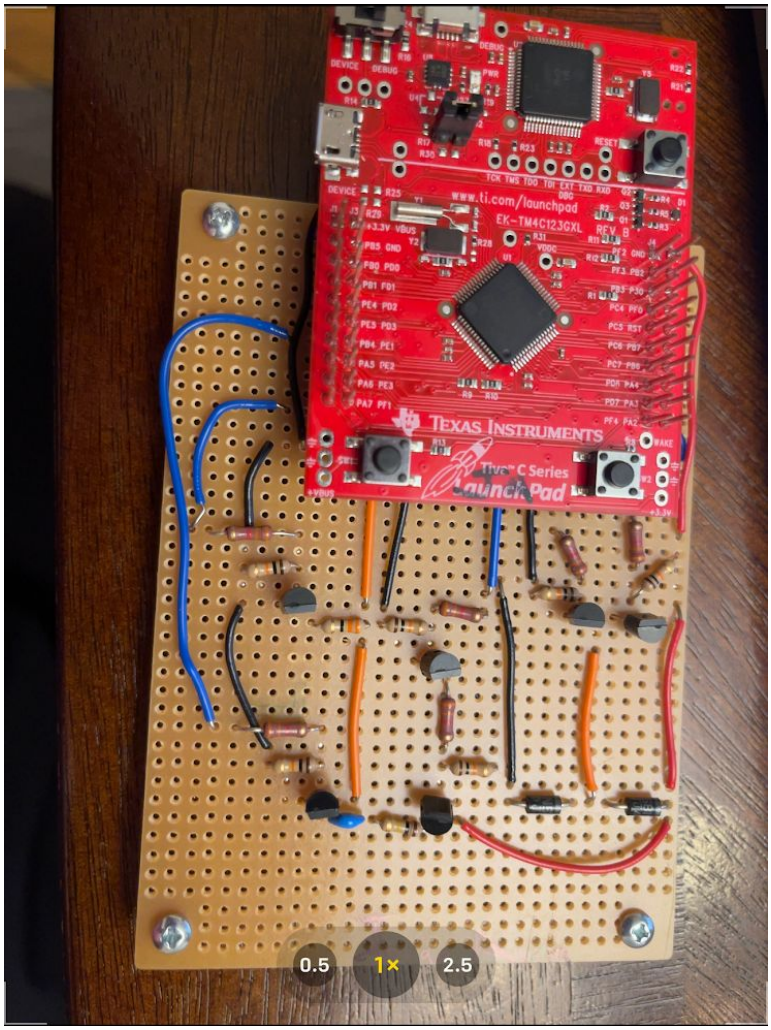
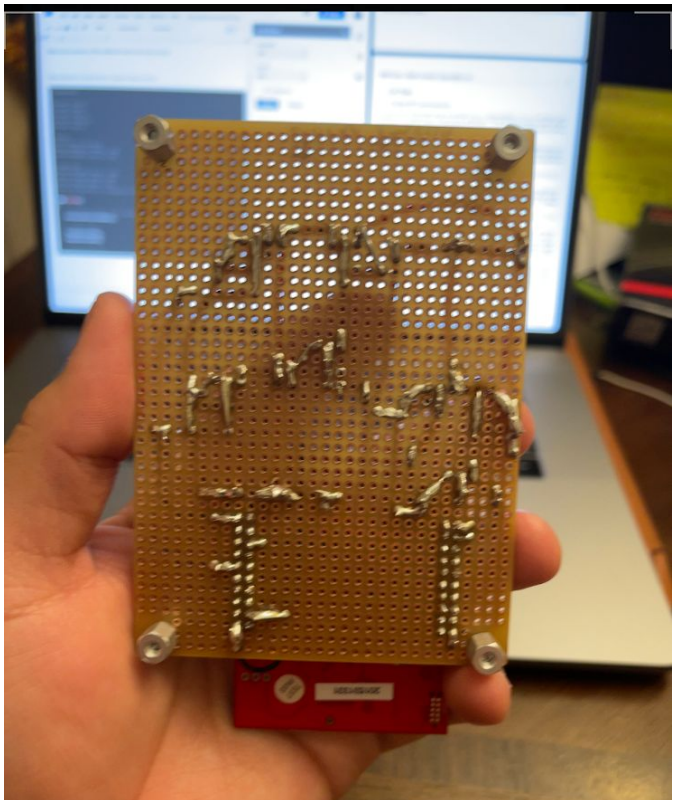
Embedded II

19 February 2021

Circuit Analysis for Embedded II

Here is an overview of the soldered board with both circuits:





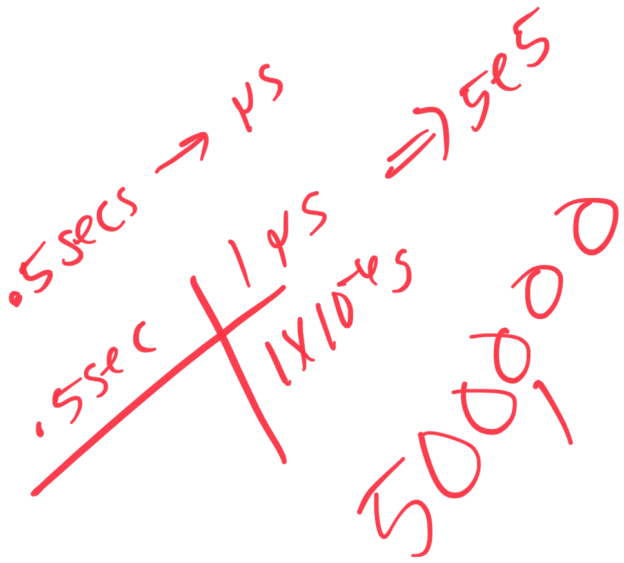
The overview of code on how I tested is shown *below*:

```
//Jorge Avila

#include "clock.h"
#include "gpio.h"
#include <stdio.h>
#include <stdlib.h>
#include "wait.h"

//define
//left side of the board
#define MEASURE_LR PORTA,2 //PA2
#define MEASURE_C PORTE,2 //PE2

//right side
#define INTEGRATE PORTE,5 //PB5
#define HIGHSIDE PORTA,3 //PA3
#define LOWSIDE PORTA,7 //PA7
#define Analog PORTE,4 //analog PE4 //not yet activated

void initHw()
{
    // Initialize system clock to 40 MHz
```

```
    initSystemClockTo40Mhz();

    // Enable clocks
    enablePort(PORTA);
    enablePort(PORTE);

    //select left side
    selectPinPushPullOutput(MEASURE_LR); //pa2
    selectPinPushPullOutput(MEASURE_C); //pe2

    //select right side
    selectPinPushPullOutput(INTEGRATE);
    selectPinPushPullOutput(HIGHSIDE);
    selectPinPushPullOutput(LOWSIDE);

}

int main(void)

{
    initHw();

    //left side
    setPinValue(MEASURE_LR, 0);
    setPinValue(MEASURE_C, 0);

    //right side
    setPinValue(INTEGRATE, 0);
    setPinValue(HIGHSIDE, 0);
    setPinValue(LOWSIDE, 0);
    while (true);

}
```

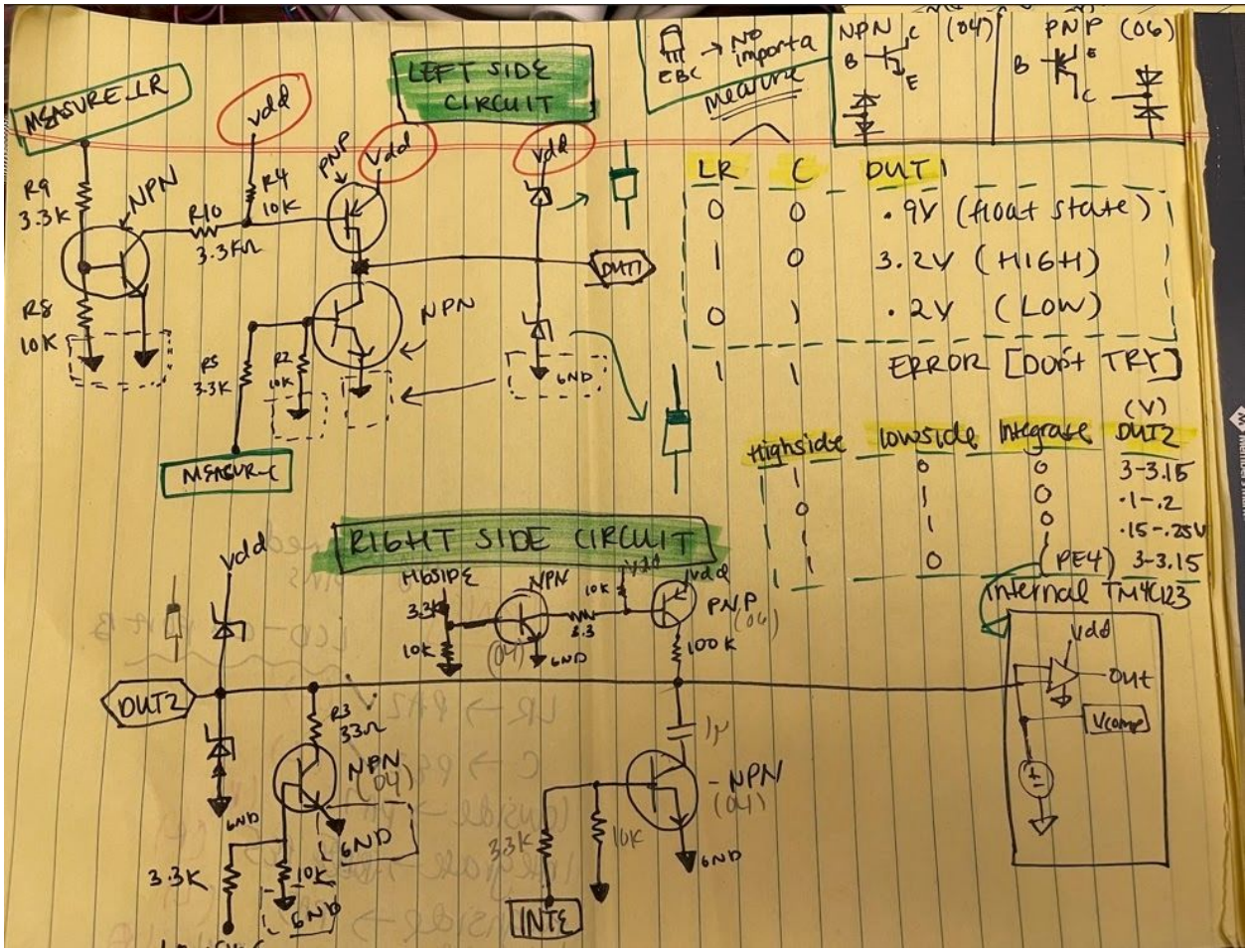
The locations of my defined pins are:

- MEASURE_LC → PA2
- MEASURE_C → PE2
- LOWSIDE → PA7
- INTEGRATE → PE5
- HIGHSIDE → PA3



- Internal Analog → PE4 (not yet implemented)

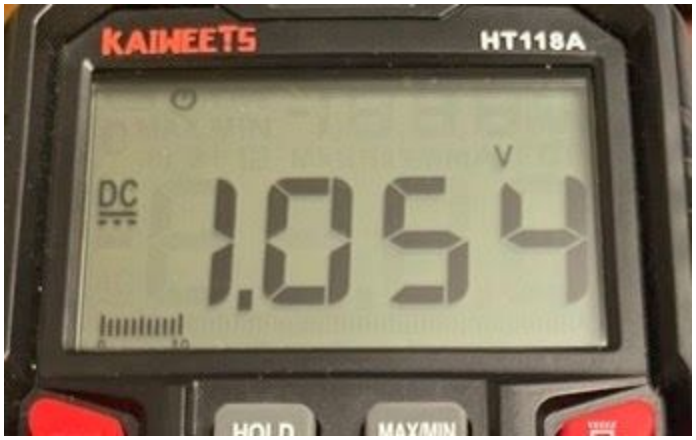
In the following picture, I used this schematic to wire my breadboard and refer to LEFT and RIGHT side circuits to make it easier. (As well as in the code)



LEFT SIDE:

When the code is set to the following **LC = 0, C = 0**, the DUT1 is shown below:

```
//left side
setPinValue(MEASURE_LR, 0);
setPinValue(MEASURE_C, 0);
```



When the code is set to the following **LC = 1, C = 0**, the DUT1 is shown below:

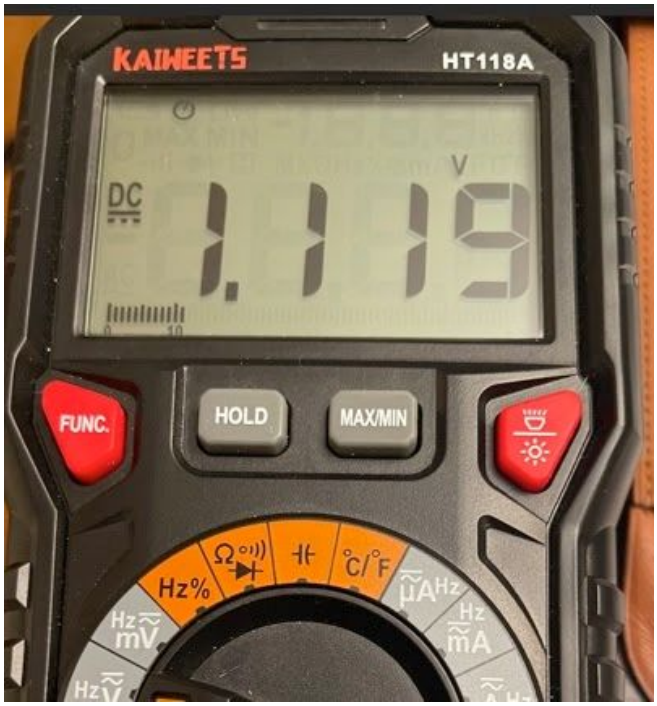
```
//left side
setPinValue(MEASURE_LR, );
setPinValue(MEASURE_C, 0);
```

When the code is set to the following **LC = 0, C = 1**, the DUT1 is shown below:

```
//left side
setPinValue(MEASURE_LR, 0);
setPinValue(MEASURE_C, 1);
```

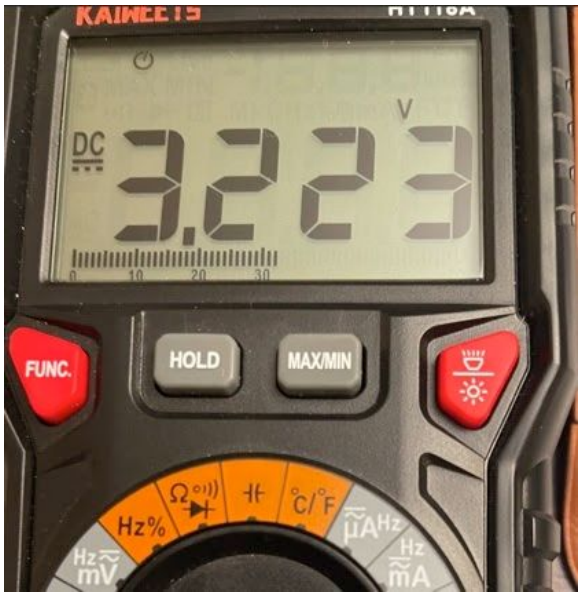
When the code is set to the following **Highside = 0, Lowside = 0, Integrate = 0,** the DUT2 is shown below:

```
//right side
setPinValue(INTEGRATE, 0);
setPinValue(HIGHSIDE, 0);
setPinValue(LOWSIDE, 0);
```



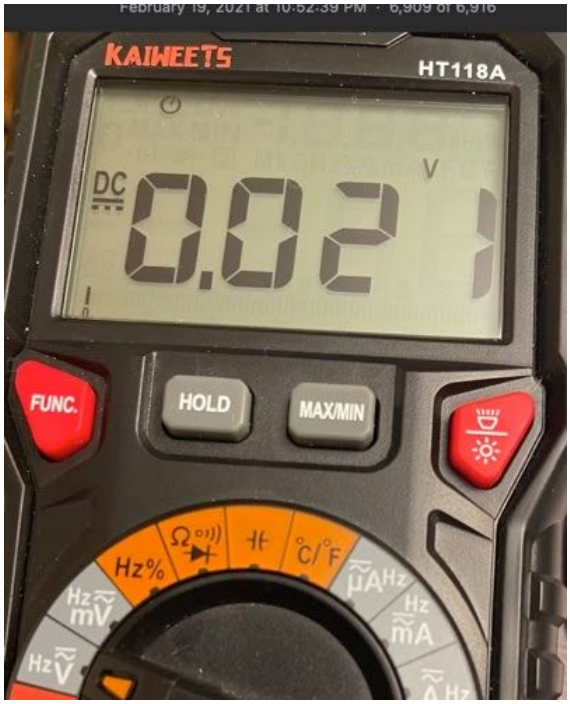
When the code is set to the following **Highside = 1, Lowside = 0, Integrate = 0,** the DUT2 is shown below:

```
//right side
 setPinValue(INTEGRATE, 0);
 setPinValue(HIGHSIDE, 1);
 setPinValue(LOWSIDE, 0);
```



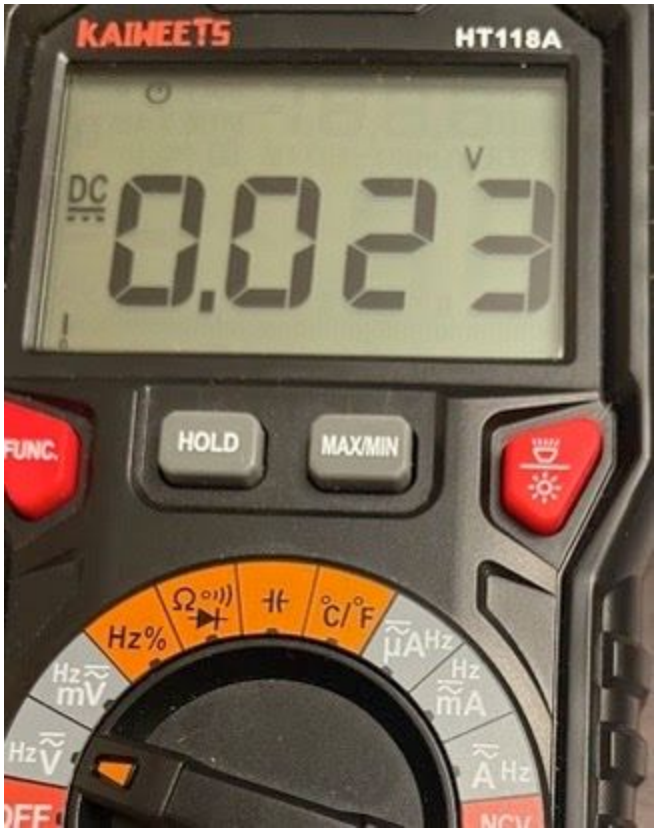
When the code is set to the following **Highside = 0, Lowside = 1, Integrate = 0,** the DUT2 is shown below:

```
//right side
 setPinValue(INTEGRATE, 0);
 setPinValue(HIGHSIDE, 0);
 setPinValue(LOWSIDE, 1);
```



When the code is set to the following **Highside = 1, Lowside = 1, Integrate = 0,** the DUT2 is shown below:

```
    //right side
    setPinValue(INTEGRATE, 0);
    setPinValue(HIGHSIDE, 1);
    setPinValue(LOWSIDE, 1);
```



When the code is set to the following **Highside = 1, Lowside = 0, Integrate = 1,** the DUT2 is shown below:

```
    //right side
    setPinValue(INTEGRATE, 0);
    setPinValue(HIGHSIDE, 1);
    setPinValue(LOWSIDE, 1);
```


DC
3.221
V
FUNC.
HOLD
MAX/MIN
Hz%
°C/°F
µA
mA
mV