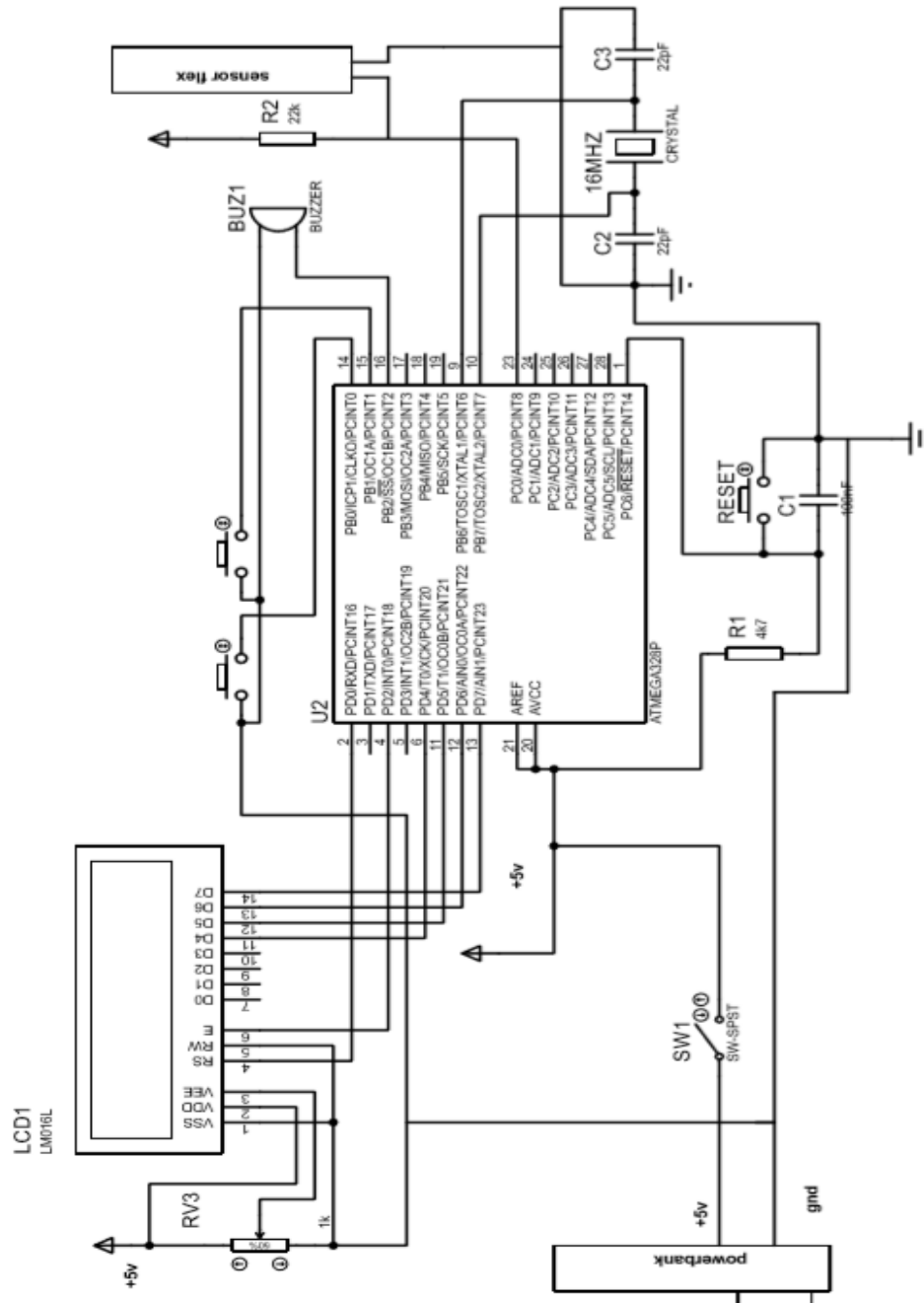
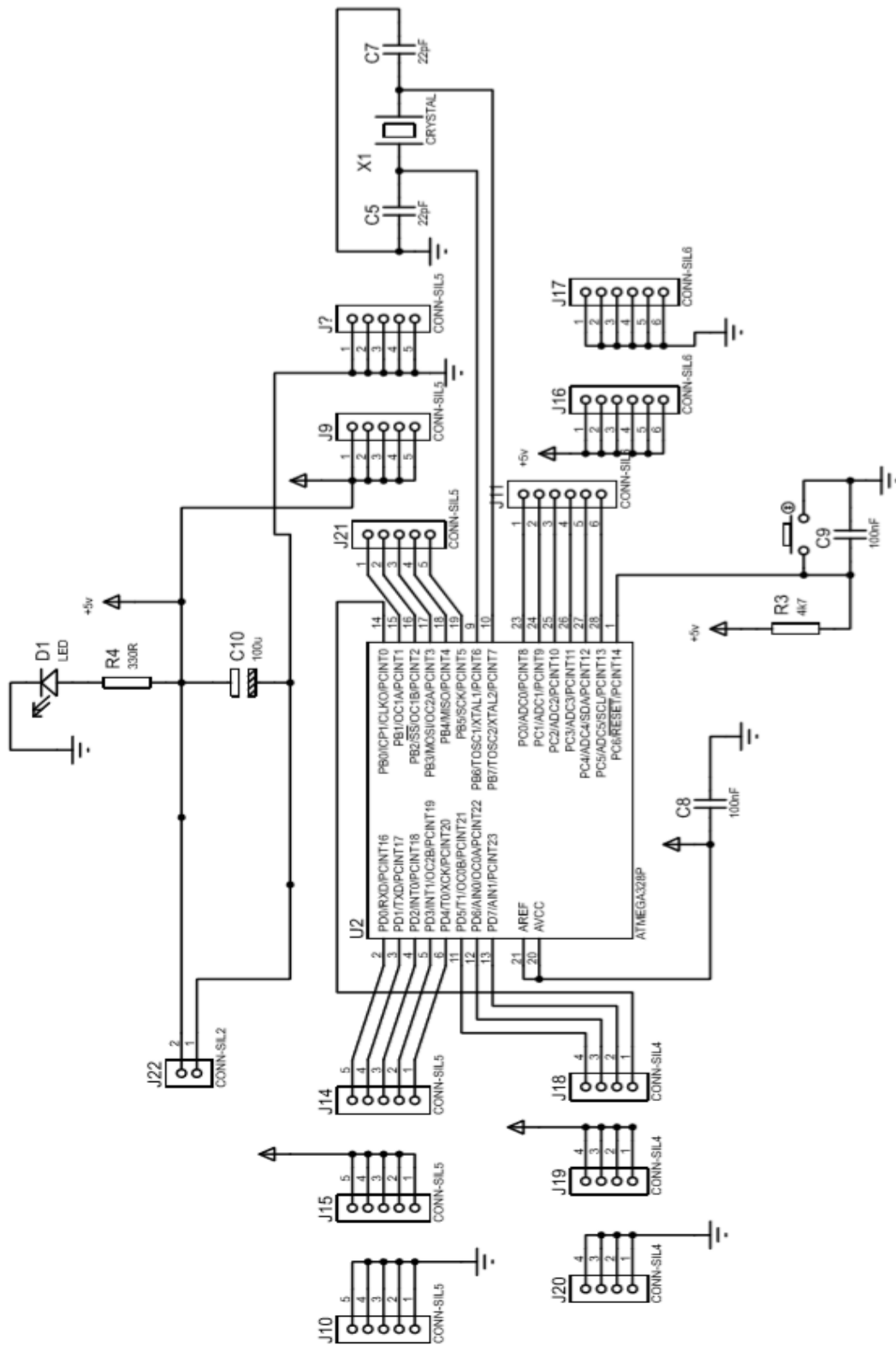


LAMPIRAN

Rangkaian Keseluruhan



Rangkaian Minimum Sistem



Listing Program

```
#include <EEPROM.h>

#include <LiquidCrystal.h>

int read_adc, menu, zero, obs, ojs;

LiquidCrystal lcd(0, 1, 2, 4, 5, 6, 7);

#define tombol1 9
#define tombol2 8
#define buz 10

int memo_oj, memo_ob;

float memo_oj_1, memo_oj_2, memo_oj_3, memo_oj_4, memo_oj_5;
float memo_ob_1, memo_ob_2, memo_ob_3, memo_ob_4, memo_ob_5;
int menu_memori, menu_memori_oj, menu_memori_ob;

void setup()
{
  // put your setup code here, to run once:

  lcd.begin(16, 2);
  memo_oj=EEPROM.read(0);
  memo_ob=EEPROM.read(6);
  pinMode(tombol2, INPUT_PULLUP);
  pinMode(tombol1, INPUT_PULLUP);
  pinMode(buz, OUTPUT);
  digitalWrite(buz, HIGH);
  memo_ob=memo_ob+1;
```

```
    memo_oj=memo_oj+1;
    delay(1000);
}
void memori()
{
    lcd.clear();
    menu_memori=0;
    menu_memori_oj=0;
    menu_memori_ob=0;
    delay(500);
    while(1)
    {
        if (digitalRead(tombol1) ==
LOW) {delay(100);lcd.clear();menu_memori=menu_memori+1;}
        if(menu_memori>1) {menu_memori=0;}
        if(menu_memori_oj>4) {break;}
        if(menu_memori_ob>4) {break;}
        if(menu_memori== 1)
        {
            if (digitalRead(tombol2) ==
LOW) {delay(100);lcd.clear();menu_memori_oj=
menu_memori_oj+1;}

            if(menu_memori_oj==0)
            {
                memo_oj_1=EEPROM.read(1);
                lcd.setCursor(0,0);lcd.print("Memory Overjet 1");
```

```
lcd.setCursor(0,1);lcd.print((memo_oj_1+1)/10);lcd.print(
"mm");
}
if(menu_memori_oj==1)
{
memo_oj_2=EEPROM.read(2);
lcd.setCursor(0,0);lcd.print("Memory Overjet 2");

lcd.setCursor(0,1);lcd.print((memo_oj_2+1)/10);lcd.print(
"mm");
}
if(menu_memori_oj== 2)
{
memo_oj_3=EEPROM.read(3);
lcd.setCursor(0,0);lcd.print("Memory Overjet 3");

lcd.setCursor(0,1);lcd.print((memo_oj_3+1)/10);lcd.print(
"mm");
}
if(menu_memori_oj== 3)
{
memo_oj_4=EEPROM.read(4);
lcd.setCursor(0,0);lcd.print("Memory Overjet 4");

lcd.setCursor(0,1);lcd.print((memo_oj_4+1)/10);lcd.print(
"mm");
}
if(menu_memori_oj== 4)
```

```

        {
            memo_oj_5=EEPROM.read(5);
            lcd.setCursor(0,0);lcd.print("Memory Overjet 5");

lcd.setCursor(0,1);lcd.print((memo_oj_5+1)/10);lcd.print(
"mm");
        }
    }

if(menu_memori== 0)
    {
        if (digitalRead(tombol2) ==
LOW) {delay(100);lcd.clear();menu_memori_ob=
menu_memori_ob+1;}

        if(menu_memori_ob== 0)
            {
                memo_ob_1=EEPROM.read(7);
                lcd.setCursor(0,0);lcd.print("Memory Overbitel");

lcd.setCursor(0,1);lcd.print((memo_ob_1+1)/10);lcd.print(
"mm");
            }

        if(menu_memori_ob==1)
            {
                memo_ob_2=EEPROM.read(8);
                lcd.setCursor(0,0);lcd.print("Memory Overbite2");

lcd.setCursor(0,1);lcd.print((memo_ob_2+1)/10);lcd.print(
"mm");
            }
    }

```

```
    }  
  
    if (menu_memori_ob==2)  
    {  
        memo_ob_3=EEPROM.read(9);  
        lcd.setCursor(0,0);lcd.print("Memory Overbite3");  
  
        lcd.setCursor(0,1);lcd.print((memo_ob_3+1)/10);lcd.print(  
"mm");  
    }  
  
    if (menu_memori_ob==3)  
    {  
        memo_ob_4=EEPROM.read(10);  
        lcd.setCursor(0,0);lcd.print("Memory Overbite4");  
  
        lcd.setCursor(0,1);lcd.print((memo_ob_4+1)/10);lcd.print(  
"mm");  
    }  
  
    if (menu_memori_ob==4)  
    {  
        memo_ob_5=EEPROM.read(11);  
        lcd.setCursor(0,0);lcd.print("Memory Overbite5");  
  
        lcd.setCursor(0,1);lcd.print((memo_ob_5+1)/10);lcd.print(  
"mm");  
    }  
    }  
    }  
}
```

```
void baca_sensor()
{
    long sum = 0; // deklarasi variabel sum
    int i;
    for (i = 0; i < 100; i++)
    {
        sum += analogRead(A0);
    }
    read_adc = sum / 100;
}

void runs()
{
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Gigit sensor");
    delay(5000);

    baca_sensor();
    lcd.clear();
    digitalWrite(buz,HIGH);
    delay(1000);
    float val = zero-read_adc;

    while (1) {

        float obs = map(val, 0, 32, 0, 6);
```



```
float ojs = map(val, 0, 42, 0, 6);
digitalWrite(buz, LOW);
if (menu == 0)
{
    lcd.setCursor(0, 0);
    lcd.print("Overjet: ");
    lcd.setCursor(0, 1);
    lcd.print(ojs, 1);
    lcd.print("mm");

    if (digitalRead(tombol2) == LOW)
    {
        delay(100);
        lcd.clear();
        EEPROM.write(0, memo_oj);
        if(memo_oj>4){memo_oj=0;}

        if(memo_oj==0){memo_oj_1=ojs;EEPROM.write(1,memo_oj_1*10)
        ;}

        if(memo_oj==1){memo_oj_2=ojs;EEPROM.write(2,memo_oj_2*10)
        ;}

        if(memo_oj==2){memo_oj_3=ojs;EEPROM.write(3,memo_oj_3*10)
        ;}

        if(memo_oj==3){memo_oj_4=ojs;EEPROM.write(4,memo_oj_4*10)
        ;}

        if(memo_oj==4){memo_oj_5=ojs;EEPROM.write(5,memo_oj_5*10)
        ;}
    }
}
```

```
    lcd.setCursor(0,0);
    lcd.print("saved :");
    lcd.print(memo_oj+1);
    memo_oj=memo_oj+1;
    delay(1000);break;
  }
}
if (menu == 1) {
  lcd.setCursor(0, 0);
  lcd.print("Overbite: ");
  lcd.setCursor(0, 1);
  lcd.print(obs,1);
  lcd.print("mm");

  if (digitalRead(tombol2) == LOW) {
    delay(100);
    lcd.clear();
    EEPROM.write(6,memo_ob);
    if(memo_ob>4){memo_ob=0;}

    if(memo_ob==0){memo_ob_1=obs;EEPROM.write(7,memo_ob_1*10);}
    ;}
    if(memo_ob==1){memo_ob_2=obs;EEPROM.write(8,memo_ob_2*10);}
    ;}
    if(memo_ob==2){memo_ob_3=obs;EEPROM.write(9,memo_ob_3*10);}
    ;}
    if(memo_ob==3){memo_ob_4=obs;EEPROM.write(10,memo_ob_4*10);}
    ;}
```

```
if(memo_ob==4){memo_ob_5=obs;EEPROM.write(11,memo_ob_5*10
);}

    lcd.setCursor(0,0);
    lcd.print("saved :");
    lcd.print(memo_ob+1);
    memo_ob=memo_ob+1;
    delay(1000);break;
}
}
}
}
void loop()
{
    // put your main code here, to run repeatedly:
    baca_sensor();
    digitalWrite(buz,LOW);
    zero = read_adc;
    /*
    lcd.setCursor(10,0);
    lcd.print(zero);
    lcd.setCursor(10,1);
    lcd.print(memo_ob);
    */
    delay(100);
    lcd.clear();
```

```
    if (digitalRead(tombol1) == LOW) {menu=menu+1;}//jika
tombol1 ditekan makamenu bergeser ke menu selanjutnya

    if (menu > 1)menu = 0;

    if (menu == 0)
    {
        lcd.setCursor(0,0);
        lcd.print(">overjet");
        lcd.setCursor(0,1);
        lcd.print(" overbite");
    }

    if (menu == 1)
    {
        lcd.setCursor(0,0);
        lcd.print(" overjet");
        lcd.setCursor(0,1);
        lcd.print(">overbite");
    }

    if (digitalRead(tombol2) == LOW && digitalRead(tombol1)
== HIGH) {delay(100);runs();}

    if (digitalRead(tombol1) == LOW && digitalRead(tombol2)
== LOW ) {delay(500);memori();}

}

float map(float x, float in_min, float in_max, float
out_min, float out_max)

{

    return (x - in_min) * (out_max - out_min) / (in_max -
in_min) + out_min;

}
```

Foto pengambilan data

Mencetak gigi negatif rahang atas
dengan bahan Alginat



Mencetak gigi negatif rahang bawah
dengan bahan Alginat



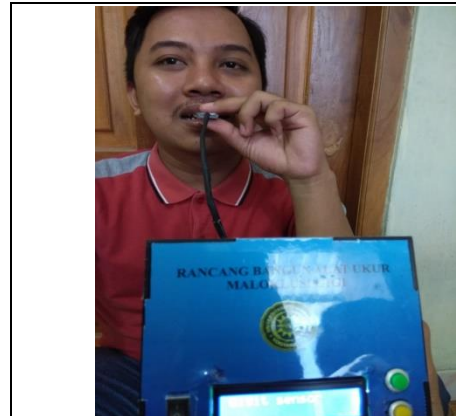
Membuat adonan alginat



Hasil cetakan gigi negatif



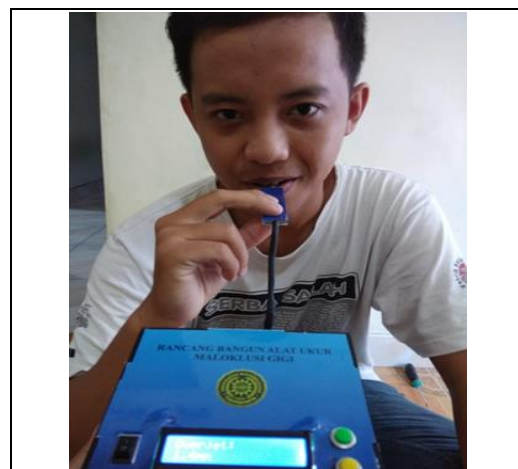
Membuat adonan gips untuk membuat cetakan gigi Positif



Pengukuran Overbite dan Overjet menggunakan modul TA



Membuat gigi positif



Pengukuran Overbite dan Overjet menggunakan modul TA