

## ДОДАТОК А

### Лістинг коду програми

```
#define LOWER_STOP_RANGE_MOVE -20  
#define UPPER_STOP_RANGE_MOVE 20  
#define LOWER_STOP_RANGE_TURN -20  
#define UPPER_STOP_RANGE_TURN 20
```

```
const int Channel1 = 7  
const int Channel2 = 8  
const int Channel3 = 32;  
const int Channel4 = 33;
```

```
const int MotorRight_R_EN = 22;  
const int MotorRight_L_EN = 23;
```

```
const int MotorLeft_R_EN = 26;  
const int MotorLeft_L_EN = 27;
```

```
const int Rpwm1 = 2;  
const int Lpwm1 = 3;  
const int Rpwm2 = 4;  
const int Lpwm2 = 5;
```

```
long pwmLvalue = 255;
```

```
long pwmRvalue = 255;
byte pwmChannel;
int robotControlState;
int last_mspeed;
boolean stop_state = true;

int ch1;
int ch2;
int ch3;
int ch4;

int moveValue;
int turnValue;

void setup(){
  pinMode(Channel1, INPUT);
  pinMode(Channel2, INPUT);
  pinMode(Channel3, INPUT);
  pinMode(Channel4, INPUT);
  pinMode(Channel5, INPUT);
  pinMode(Channel6, INPUT);
  pinMode(Channel7, INPUT);
  pinMode(Channel8, INPUT);
  Serial.begin(9600);

  pinMode(MotorRight_R_EN, OUTPUT);
```

```
pinMode(MotorRight_L_EN, OUTPUT);
```

```
pinMode(MotorLeft_R_EN, OUTPUT);
```

```
pinMode(MotorLeft_L_EN, OUTPUT);
```

```
pinMode(Rpwm1, OUTPUT);
```

```
pinMode(Lpwm1, OUTPUT);
```

```
pinMode(Rpwm2, OUTPUT);
```

```
pinMode(Lpwm2, OUTPUT);
```

```
stop_Robot();
```

```
}
```

```
void loop() {
```

```
  ch1 = pulseIn(Channel1, HIGH, 25000);
```

```
  ch2 = pulseIn(Channel2, HIGH, 25000);
```

```
  ch3 = pulseIn(Channel3, HIGH, 25000);
```

```
  ch4 = pulseIn(Channel4, HIGH, 25000);
```

```
  turnValue = map(ch1, 1082, 1910, -255, 255);
```

```
  turnValue = constrain(turnValue, -255, 255);
```

```
  moveValue = map(ch2, 1082, 1910, -255, 255);
```

```
  moveValue = constrain(moveValue, -255, 255);
```

```
Serial.println("ch1: "+String(ch1)+ ", ch2: "+String(ch2)+ ", ch3: "+String(ch3)+ ",
ch4: "+String(ch4));
```

```
if (moveValue>LOWER_STOP_RANGE_MOVE &&
moveValue<UPPER_STOP_RANGE_MOVE &&
turnValue>LOWER_STOP_RANGE_TURN &&
turnValue<UPPER_STOP_RANGE_TURN){
```

```
    if(stop_state == false){
        stop_Robot();
        stop_state = true;
        Serial.println("Stop Robot");
    }
```

```
}
```

```
else if(turnValue>LOWER_STOP_RANGE_TURN &&
turnValue<UPPER_STOP_RANGE_TURN){
```

```
    if(moveValue>UPPER_STOP_RANGE_MOVE){
        go_Forward(moveValue);
        stop_state = false;
        Serial.println("Go Forward");
    }
```

```
else if(moveValue<LOWER_STOP_RANGE_MOVE){
```

```
    go_Backwad(abs(moveValue));
    stop_state = false;
    Serial.println("Go Backward");
}
```

```
}
```

```
else if(moveValue>LOWER_STOP_RANGE_MOVE &&
moveValue<UPPER_STOP_RANGE_MOVE){
```

```

    if(turnValue>UPPER_STOP_RANGE_TURN){
        turn_Right(turnValue);
        stop_state = false;
        Serial.println("Turn Right");
    }
    else if(turnValue<LOWER_STOP_RANGE_TURN){
        turn_Left(abs(turnValue));
        stop_state = false;
        Serial.println("Turn Left");
    }
}
delay(500);
}

void go_Backwad(int mspeed){
    if(robotControlState!=1 || last_mspeed!=mspeed){
        SetMotors(1);
        analogWrite(Rpwm1, 0);
        analogWrite(Lpwm1, mspeed);
        analogWrite(Rpwm2, mspeed);
        analogWrite(Lpwm2, 0);
        robotControlState=1;
        last_mspeed=mspeed;
    }
}

```

```
void go_Forward(int mspeed){  
    if(robotControlState!=2 || last_mspeed!=mspeed){  
        SetMotors(1);  
        analogWrite(Rpwm1, mspeed);  
        analogWrite(Lpwm1, 0);  
        analogWrite(Rpwm2, 0);  
        analogWrite(Lpwm2, mspeed);  
        robotControlState=2;  
        last_mspeed=mspeed;  
    }  
}
```

```
void turn_Left(int mspeed){  
    if(robotControlState!=3 || last_mspeed!=mspeed){  
        SetMotors(1);  
        analogWrite(Rpwm1, mspeed);  
        analogWrite(Lpwm1, 0);  
        analogWrite(Rpwm2, mspeed);  
        analogWrite(Lpwm2, 0);  
        robotControlState=3;  
        last_mspeed=mspeed;  
    }  
}
```

```
void turn_Right(int mspeed){  
    if(robotControlState!=4 || last_mspeed!=mspeed){
```

```

    SetMotors(1);
    analogWrite(Rpwm1, 0);
    analogWrite(Lpwm1, mspeed);
    analogWrite(Rpwm2, 0);
    analogWrite(Lpwm2, mspeed);
    robotControlState=4;
    last_mspeed=mspeed;
}
}

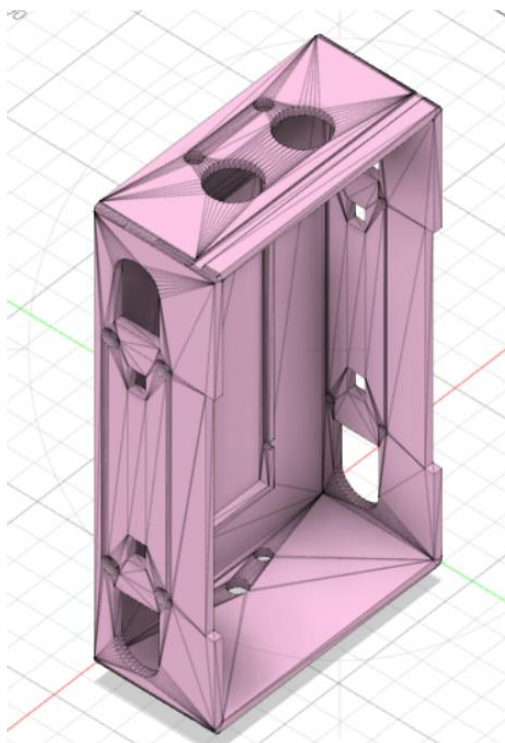
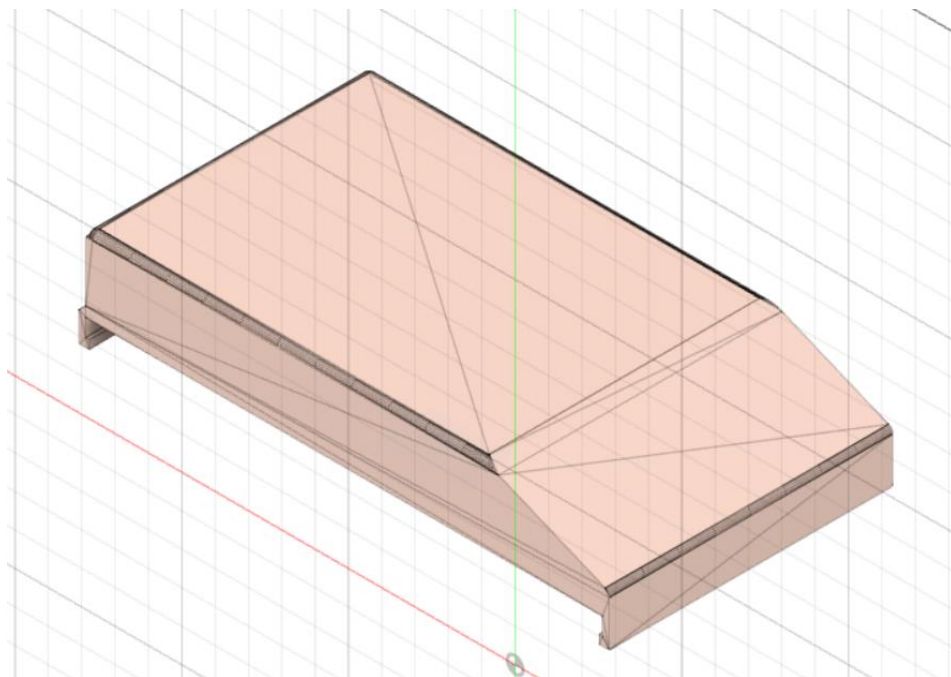
void SetMotors(int controlCase){
    switch(controlCase){
        case 1:
            digitalWrite(MotorRight_R_EN, HIGH);
            digitalWrite(MotorRight_L_EN, HIGH);
            digitalWrite(MotorLeft_R_EN, HIGH);
            digitalWrite(MotorLeft_L_EN, HIGH);
            break;
        case 2:
            digitalWrite(MotorRight_R_EN, LOW);
            digitalWrite(MotorRight_L_EN, LOW);
            digitalWrite(MotorLeft_R_EN, LOW);
            digitalWrite(MotorLeft_L_EN, LOW);
            break;
    }
}

```

```
void stop_Robot(){  
    if(robotControlState!=0){  
        analogWrite(Rpwm1, 0);  
        analogWrite(Lpwm1, 0);  
        analogWrite(Rpwm2, 0);  
        analogWrite(Lpwm2, 0);  
        robotControlState = 0;  
    }  
}
```

## ДОДАТОК Б

Демонстраційний графічний матеріал



| № |  | Позначення          |  | Найменування                       |  | Дод. відомості  |  |
|---|--|---------------------|--|------------------------------------|--|-----------------|--|
|   |  |                     |  | Текстові документи                 |  |                 |  |
|   |  |                     |  |                                    |  |                 |  |
| 1 |  | ГЮИК. 505330.021 ПЗ |  | Пояснювальна записка               |  | 84 с., ф. А4    |  |
| 2 |  |                     |  | Лістинг програмного коду           |  | 8 с., ф. А4     |  |
|   |  |                     |  |                                    |  |                 |  |
|   |  |                     |  | Графічні документи                 |  |                 |  |
|   |  |                     |  |                                    |  |                 |  |
| 3 |  |                     |  | Демонстраційний графічний матеріал |  | у форматі *.ppt |  |
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