ANEXO E. Código de cada estación individual.

- Código Estación Central

```
#include <SoftwareSerial.h>
SoftwareSerial BT1(2, 3); // RX | TX
SoftwareSerial XB1(13, 12); // RX | TX

int dato=0;
void setup() {
      pinMode(7,OUTPUT);
      pinMode(6,OUTPUT);
      digitalWrite(6,HIGH);
      digitalWrite(7,LOW);
      Serial.begin(9600);
      XB1.begin(9600); //comunicación con xbee
      BT1.begin(9600); //comunicación con mod bluetooth
}

void loop() {
if (BT1.available())
           { dato=BT1.read();
           }
            if (dato != 0)
            {
              XB1.write(dato);
              delay(20);
              digitalWrite(7,HIGH);
              delay(500);
              digitalWrite(7,LOW);
              dato=0;

            }
            else {
              digitalWrite(7,LOW);
            }
}
```

- Código Estación 1 "Conejo"

```
#include <SoftwareSerial.h>

//SoftwareSerial mySerial(2, 3); // RX, TX


int dato=0;
int var=0;
int pwm=255;
void setup() {
  // put your setup code here, to run once:
      pinMode(9,OUTPUT);//PWM1
      digitalWrite(9, LOW);
```

```
      pinMode(10,OUTPUT);//PWM2
      digitalWrite(10, LOW);
      pinMode(5,OUTPUT);//PWM3
      digitalWrite(5, LOW);
      pinMode(6,OUTPUT);//PWM4
      digitalWrite(6, LOW);
      Serial.begin(9600); //comunicación con xbee
      ubicacion_inicial();
      armar1();
      }

void loop() {

          if (Serial.available()){
           dato = Serial.read();
           }
           leer_velocidad();
           if(dato == '8'){
              start();
              delay(200);
              dato=0;
           }

}

void ubicacion_inicial(){
    while (digitalRead(11) == 1){
     digitalWrite(10,LOW);

     digitalWrite(9,HIGH);
    }
     digitalWrite(9,LOW);
     return;
}

void armar1(){
  while(analogRead(A0)<1020){
    int pwm=((1040-analogRead(A0))/3)+32;
    digitalWrite(6,LOW);
    analogWrite(5,pwm);

  }
    digitalWrite(6,LOW);
    digitalWrite(5,LOW);

    while(analogRead(A0)>800){
    digitalWrite(5,LOW);
    analogWrite(6,30);

  }
    digitalWrite(6,LOW);
    digitalWrite(5,LOW);
}

void leer_velocidad(){
           if(dato == '3'){
```

```
            pwm=195;
            dato=0;
            return;
            }else if(dato == '4'){
            pwm=207;
            dato=0;
            return;
            }else if(dato == '5'){
            pwm=219;
            dato=0;
            return;
            }else if(dato == '6'){
            pwm=243;
            dato=0;
            return;
            }else if(dato == '7'){
            pwm=255;
            dato=0;
            return;
            }else {
            return;
            }
}
void armar(){
  while(analogRead(A0)<1020){
    int pwm=((1040-analogRead(A0))/3)+32;
    digitalWrite(6,LOW);
    analogWrite(5,pwm);

    if(digitalRead(12) == 0 || digitalRead(11) == 0){
      digitalWrite(6,LOW);
      digitalWrite(5,LOW);
      return;
    }
  }
    digitalWrite(6,LOW);
    digitalWrite(5,LOW);

    while(analogRead(A0)>800){
    digitalWrite(5,LOW);
    analogWrite(6,30);
    if(digitalRead(12) == 0 || digitalRead(11) == 0){
      digitalWrite(6,LOW);
      digitalWrite(5,LOW);
      return;
    }
  }
    digitalWrite(6,LOW);
    digitalWrite(5,LOW);
}
```

```
      return;
    }
  }
    digitalWrite(6,LOW);
    digitalWrite(5,LOW);
}



void start(){
  for(int x = 0; x < 5; x++){
    while (digitalRead(12) == 1){
     digitalWrite(9,LOW);
     analogWrite(10,pwm);
     if(digitalRead(15)== 0){
      armar();
     }
    }
      digitalWrite(10,LOW);
      digitalWrite(9,LOW);
      if(analogRead(A0)>850){
        while(analogRead(A0)>800){
        digitalWrite(5,LOW);
        analogWrite(6,30);
      }
      digitalWrite(6,LOW);
      digitalWrite(5,LOW);

     }

   while (digitalRead(11) == 1){
    digitalWrite(10,LOW);
    analogWrite(9,pwm);
    if(digitalRead(15)== 0){
     armar();
    }
   }
     digitalWrite(10,LOW);
     digitalWrite(9,LOW);
     if(analogRead(A0)>850){
       while(analogRead(A0)>800){
       digitalWrite(5,LOW);
       analogWrite(6,30);
     }
     digitalWrite(6,LOW);
     digitalWrite(5,LOW);
 }
 }
     digitalWrite(10,LOW);
     digitalWrite(9,LOW);
     if(analogRead(A0)>850){
       while(analogRead(A0)>800){
       digitalWrite(5,LOW);
       analogWrite(6,30);
```

```
      }
      digitalWrite(6,LOW);
      digitalWrite(5,LOW);
      }
  return;
}
```

- Código Estación 2 "Discos"

```
#include <SoftwareSerial.h>

SoftwareSerial mySerial(2, 3); // RX, TX
int dato=0;
void setup() {
  // put your setup code here, to run once:
      pinMode(5,OUTPUT);//EN
      pinMode(6,OUTPUT);//IN1
      pinMode(7,OUTPUT);//IN2
      pinMode(A2,OUTPUT);//IN2
      mySerial.begin(9600); //comunicación con xbee
      digitalWrite(A2,HIGH);
      ubicar();
}

void loop() {
  // put your main code here, to run repeatedly:
   if (mySerial.available()){
           dato = mySerial.read();
           }

           if(dato == '1'){
              restart();
              delay(200);
              dato=0;
           }
           if(dato == '2'){

               restart();
              delay(200);
              dato=0;
            }

}

void ubicar(){
  while(digitalRead(A1)==0){
  digitalWrite(5,HIGH);
  digitalWrite(6,HIGH);
}
digitalWrite(5,LOW);
digitalWrite(6,LOW);
}
```

```
void restart(){
  while(digitalRead(A0)==0){
  digitalWrite(5,HIGH);
  digitalWrite(7,HIGH);
}
digitalWrite(5,LOW);
digitalWrite(7,LOW);
while(digitalRead(A1)==0){
  digitalWrite(5,HIGH);
  digitalWrite(6,HIGH);
}
digitalWrite(5,LOW);
digitalWrite(6,LOW);
}
```

- Código estación 3 "cambio de rollos"

```
#include <SoftwareSerial.h>

SoftwareSerial mySerial(2, 3); // RX, TX
int dato=0;
void setup() {
  // put your setup code here, to run once:
      pinMode(5,OUTPUT);//EN
      pinMode(6,OUTPUT);//IN1
      pinMode(7,OUTPUT);//IN2
      pinMode(A2,OUTPUT);//IN2
      mySerial.begin(9600); //comunicación con xbee
      digitalWrite(A2,HIGH);
      ubicar();
}

void loop() {
  // put your main code here, to run repeatedly:
   if (mySerial.available()){
           dato = mySerial.read();
           }

           if(dato == '9'){
              cambiorollo();
              delay(200);
              dato=0;
           }
```

```
}

void ubicar(){
  while(digitalRead(A1)==0){
  digitalWrite(5,HIGH);
  digitalWrite(6,HIGH);
}
digitalWrite(5,LOW);
digitalWrite(6,LOW);
}

void cambiorollo(){
  while(digitalRead(A0)==0){
  digitalWrite(5,HIGH);
  digitalWrite(7,HIGH);
}
digitalWrite(5,LOW);
digitalWrite(7,LOW);

}
```