**Communication Systems**

**Final Project**

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**Outline:**

1. Introduction: A paragraph that explains briefly the main idea and target of the project.
2. Components
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7. **Introduction**

The aim of this project is to build a **Room Tracker System** that tracks a person to know exactly his location (Room Number) in the GUC Campus (C3 Building, 3rd Floor) and sends the number of the Room (Location) to the Mobile.

1. **Components (x3)**

* Arduino UNO
* Breadboard
* Bluetooth Module (HC-05)
* Zigbee Module (XBEE S1)
* XBEE USB Adapter Board
* USB 5-Pin Cable

1. **Diagram**

**Bluetooth**

**Module**

**Zigbee**

**Receiver**

**Zigbee**

**Transmitter**

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**Bluetooth**

**Module**

1. **Description**

The System consists of **2 Transmitter Circuits (1 in each Room) and a Receiver Circuit (in the Doctor’s Room)**. Each Transmitter Circuit consists of an Arduino UNO Board, Bluetooth module and a **Zigbee Module which acts as a Transmitter.** While the Receiver Circuit consists of the same components but the **Zigbee Module acts as a Receiver.** ‘XCTU Software’has been used to **configure the Zigbees** and the codes have been written using **Arduino IDE Software**. So, lets proceed with the **System Simulation**, the doctor connects his mobile with the Bluetooth Module in the Receiver Circuit, then the Student (Team-Mate) will connect with the Transmitter Circuit in the room where he exists, a connection **(Pairing)** will occur and the **state of the Bluetooth Module will change**, then the **Zigbee (Transmitter) will send the Room Number to the other Zigbee in the Receiver Circuit**, then it will be sent to the Doctor’s Mobile through the **Bluetooth Module.**

1. **Codes**

* **Transmitter 1 (Room: C3.309)**

#include <SoftwareSerial.h>

SoftwareSerial BTserial(10,11);

int statePin = 12;

void setup() {

// put your setup code here, to run once:

BTserial.begin(9600);

pinMode(statePin, INPUT);

}

void loop() {

// put your main code here, to run repeatedly:

if(digitalRead(statePin) == 1){

BTserial.println("C3.309!");

delay(10000);

}

}

* **Transmitter 2 (Room: C3.311)**

#include <SoftwareSerial.h>

SoftwareSerial BTserial(10,11);

int statePin = 12;

void setup() {

// put your setup code here, to run once:

BTserial.begin(9600);

pinMode(statePin, INPUT);

}

void loop() {

// put your main code here, to run repeatedly:

if(digitalRead(statePin) == 1){

BTserial.println("C3.311!");

delay(10000);

}

}

* **Receiver**

#include <SoftwareSerial.h>

SoftwareSerial BTserial(10,11);

const byte numChars = 10;

char receivedChars[numChars];

boolean newData = false;

void setup()

{

BTserial.begin(9600);

}

void loop()

{

static byte ndx = 0;

char endMarker = '!';

char rc;

while (BTserial.available() > 0 && newData == false) {

rc = BTserial.read();

if (rc != endMarker) {

receivedChars[ndx] = rc;

ndx++;

if (ndx >= numChars) {

ndx = numChars - 1;

}

}

else {

receivedChars[ndx] = '\0';

ndx = 0;

newData = true;

}

}

if (newData == true && BTserial.available()>0 ) {

BTserial.println(receivedChars);

delay(1000);

BTserial.flush();

newData = false;

}

}

1. **References**

* <https://www.sparkfun.com/datasheets/Wireless/Zigbee/XBee-Datasheet.pdf>
* <https://www.parallax.com/sites/default/files/downloads/32400-XBee-USB-Adapter-Documentation-v1.0.pdf>
* <http://microcontrollerslab.com/zigbee-interfacing-arduino/#What_is_Zigbee>
* <https://github.com/PaulStoffregen/SoftwareSerial>
* <http://www.instructables.com/id/Arduino-AND-Bluetooth-HC-05-Connecting-easily/>