



Khulna University of Engineering and Technology

Department of Electronics and Communication Engineering

**Project Proposal (ECE 3200)**

3<sup>rd</sup> Year 2<sup>nd</sup> Term

**Names and Rolls of the Students:**

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**Project Supervisor:**

Dr. Monir Hossen

Professor

Dept of ECE,

KUET

**Project Title: Long Distance Wireless Arduino Based Walkie Talkie**

**Related Courses Studied:**

Title	Code	Obtained Grade	
		1909005	1909013
Analog Electronics-I	ECE 1209	A+	A+
Computer Fundamentals and Programming	CSE 1209	A+	A+
Industrial Engineering	ECE 3101	A+	B
Digital Communication	ECE 3205	N/A	N/A

**Motivation:**

When a catastrophic natural disaster strikes, an organized and effective rescue operation is essential to rescue those victims trapped under collapsed buildings or landslides as well as to relief massive survivals who lose their life support. However, communication systems were usually paralyzed by many causes. The loss of communication systems made rescue and relief operations extremely difficult, costing many lives unnecessarily. A walkie-talkie device can be quite useful in the location where there is no cellphone coverage. Even in the cellphone coverage area it provides communication at very low cost. Currently the law enforcement and military personnel uses frequency modulation (FM) based walkie-talkie systems. The main goal of this project is to design and develop a low-cost walkie-talkie device that can be used by anyone other than the military and law enforcement personals.

**Objectives:**

- To establish long distance communication wirelessly.
- Implement a walkie-talkie system leveraging Arduino microcomputers to enable portable and adaptable communication solutions.
- To Engineer signal enhancement techniques and error correction mechanisms to ensure consistent and reliable communication over extended distances.

## Research Methodology & Implementation:

### Components Required:

Component Name	Rating
Audio Amplifier	PAM8403
Microphone Amplifier	MAX9814
DC to DC booster	CE8301
Speaker	-
Battery	-
Arduino Nano	-
Adapter	AMS1117
RF Transceiver	nRF24L01
Push to Talk switch	-

### Block Diagram:

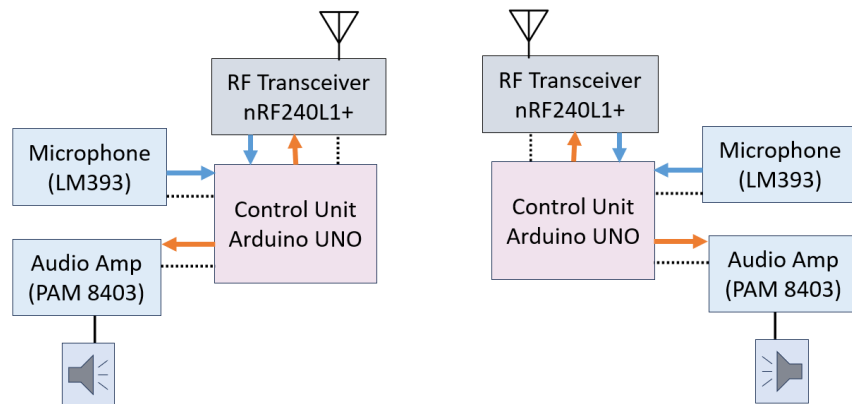


Figure 1: Block diagram of the proposed circuit

## Circuit Diagram:

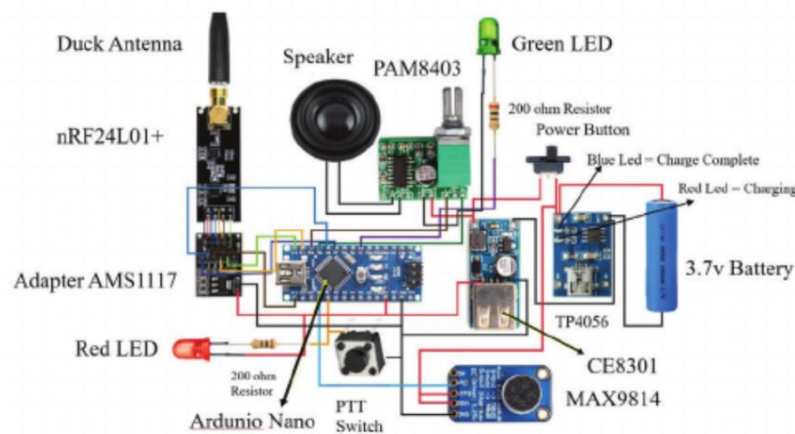


Figure 2: Circuit Diagram

## Circuit Explanation:

In this circuitry, the microphone generates an audio signal which is converted from analog to digital (ADC) by microcontroller. The converted digital signal is then transmitted by the transceiver by GFSK modulation. The other walkie talkie circuit receives the modulated signal and amplifies it in the built in low noise amplifier. After amplification the signal is digital to analog converted (DAC). The audio amplifier amplifies the signal and then sends it to the speaker. The speaker then converts the demodulated signal to sound.

## Work Plan (Schedule):

Project Selection and Initialization	1 week
Project Components and Resources Finding	2-4 days
Learning the necessary skills	1 week
Breadboard Implementation of the project	3-4 weeks
PCB or Veroboard Implementation	1-2 weeks

**Expected Outcome and Impact:**

We are hopeful to implement mobile communication in a range of approximately 1km which only transfers audio signal from one device to another and develop the system further to make it affordable and available for public use so that every small start-up, factories, programs and institutes can be benefitted by the low-cost inhouse communicating device.

Signature of the Students and Date:

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Rifah Tasnia Joita

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Md Saif Alvi

Signature of the Supervisor and Date:

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Dr. Monir Hossen

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