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Design & Implementation of Mobile Jammer with Prescheduled Time Duration

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Abstract: Mobile jammer is used to prevent mobile phones from receiving or transmitting signal switch the base stations. It is effectively disable mobile phones within the defined regulated zones without causing any interference to other communication means, like television and radio broadcasting systems. It can be used in practically any location, but are used in places where a phone call would be particularly disruptive like Libraries, Hospitals, Cinema halls, schools & colleges, etc. As with other radio jamming, mobile jammers block mobile phone use by sending out radio waves along the same frequencies that mobile phones use I.e. for 900 MHZ and 1800 MHZ. This causes enough interference with the communication between mobile phones and communicating towers to render the phones unusable. Upon activating mobile jammers, all mobile phones will indicate "NO NETWORK" in the necessary places. When the mobile jammers are turned off, all mobile phones will automatically re-establish communications and provide full service.

It was originally developed for law enforcement and the military to interrupt communications by criminals and terrorists to foil the use of certain remotely detonated explosives. The signal isolator contains IF and RF section. IF section is used to generating tuning signal for feeding the RF section. The RF section is amplified the tuning signal and distribute the signal to surround air through antenna. The income (downlink) calling and jamming signal cancelled each other before interring to a phone.

In this project, its controlling this mobile jammer by means of PIC16F77 microcontroller IC. Language which is used embedded C language. Compilation this program is in microC and finally our simulation is assembled through Proteus. The activation and deactivation time schedules can be programmed with microcontroller. Real time clock chip DS1307 is used to set the schedules and used triple output regulated AC to DC power supply.

Keywords: Mobile jammer, jam zone, no network, scheduled jammer etc.,

I.INTRODUCTION

A GSM jammer is a device that send signal on the same frequency at which the GSM system operates frequency 900MHZand1800MHZ, the jamming is success when the mobile phones in the area where the jammer is located are disabled. Communication jamming devices were first developed and used by military. Where tactical commanders used RF communications to exercise control of their forces, an enemy has interest in those communications. This interest comes from the fundamental area of denying the successful transport of the information from the sender to the receiver. Nowadays the mobile jammer devices are becoming civilian products rather than electronic warfare devices, since with the increasing number of the mobile phone user the need to disable mobile phone in specific places where the ringing of cell phone would be disturbance has increased. These places included Worship places, university lecture rooms, libraries, concert halls, meeting rooms, and other places where silence is appreciated.

II.LITERATURE REVIEW

Jamming techniques: There are several ways to jam a mobile set. Three most common techniques can be categorized as follows.

II.1.i. Spoofing: In this kind of jamming, the device automatically forces the mobile to turn off itself. This type is very difficult to be implemented since the jamming device first detects any mobile phone in a specific area, then the device sends the signal to disable the mobile phone. Some types of this technique can detect if a nearby mobile phone is there and sends a message to tell the user to activate silent mode or switch it off.

II.1.ii SMS spoofing: It is other technology which uses the Short Message Service (SMS), available on most mobile phones and personal digital assistants, to set who the message appears to come from by replacing the originating mobile number (Sender ID) with alphanumeric text. Spoofing has both legitimate uses (setting the company name from which the message is being sent, setting your own mobile number, or a product name) and illegitimate uses (such as

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impersonating another person, company, and product).

II.1.iii.Shielding Attacks: This is known as TEMPEST or EMF shielding. This kind requires closing an area in a faraday cage so that any device inside this cage cannot transmit or receive RF signal from outside of the cage. This area can be as large as buildings. We can't shield power-frequency AC magnetic fields. We may be able to do so, but the cost is typically prohibitive, compared with some better approach.
II.1.iv Denial of Service: This technique is referred to DOS. In this technique, the device transmits a noise signal at the same frequency at which mobile phone is operating in order to decrease the Signal-to-Noise Ratio (SNR).
II.2.v Previous Work: The rapid proliferation of mobile phones at the beginning of the 21st century to near ever-present status eventually raised problems such as their potential use to invade privacy or contribute to out of control and egregious academic cheating. In addition, public backlash was growing against the intrusive disruption cell phones introduced in daily life. While older analogue mobile phones often suffered from chronically poor reception and could even be disconnected by simple interference such as high frequency noise, increasingly sophisticated digital phones have led to more elaborate counters.
Mobile phone jamming devices are an alternative to more expensive measures against mobile phones, such as Faraday cages, which are mostly suitable as built in protection for structures. They were originally developed for law enforcement and the military to interrupt communications by criminals and terrorists. Some were also designed to foil the use of certain remotely detonated explosives. The civilian applications were apparent, so over time many companies originally contracted to design jammers for government use switched over to sell these devices to private entities. Since then, there has been a slow but steady increase in their purchase and use, especially in major metropolitan areas.
GSM, used in digital cellular and PCS-based systems, operates in the 900-MHz and 1800-MHz bands in Europe and Asia and in the 1900-MHz (sometimes referred to as 1.9-GHz) band in the United States. Jammers can broadcast on any frequency and are effective against AMPS, CDMA, TDMA, GSM, PCS, DCS and Nextel systems. Old fashioned analog cell phones and today's digital devices are equally susceptible to jamming.
A jamming device transmits on the same radio frequencies as the cell phone that is 900MHz and 1800MHZ disrupting the communication between the phone and the cell-phone base station in the town. It is a called a "denial-of-service attack".
The jammer denies service of the radio spectrum to the cell-phone users within range of the jamming device. Older jammers sometimes were limited to working on phones using only analogue or older digital mobile phone standards.
Newer models such as the double band jammers can block all widely used systems (AMPS, GSM, etc) and are even very effective against newer phones which hop to different frequencies and systems when interfered with. As the dominant network technology and frequencies used for mobile phones vary worldwide, some work only in specific regions such as Europe and North America. The power of the jammer's effect can vary widely based on factors such as proximity to towers, indoor and outdoor settings, presence of buildings and landscape, even temperature and humidity play a role. There are concerns that crudely designed jammers may disrupt the functioning of medical devices such as pacemakers. However, like cell phones, most of the devices in common use operate at low enough power output (<1W) to avoid causing any problems.
II.3.our work: The jamming device was successfully designed and subsequently constructed with success. The device was tested against all cellular carriers currently operating on the GSM band for example in Pakistan, including; Mobil link GSM, Telenor, Warid, Paktel, UfoneAmong the constraints that they faced during the design was the fact that the power amplifier that they were using, the PF08103B, was locally acquired, and all of the purchased IC's had internal inter-pin short-circuits, making them unfit for use. To bypass this constraint, they used a HITTITE GSM power amplifier, which's gain was 20dB – significantly lower than the PF08103B's 33dB power gain.
Thus, the jamming diameter was expectedly below the maximum theoretical value calculated, because of atmospheric losses. The range varied from 10m to up to 20m depending upon atmospheric conditions (such as the time of the day), and the coverage intensity at the testing site. The power section of the device was, despite the complete success of the rest of the project, a bit troublesome near the end. Because of the lack of current regulation, the subsequent sections experienced voltage dips, which made the device less dependable.
This project, which turned out to be a full success, they designed a device that stops phone ringing. This device could be used in places where ringing is not desired at specific times, as these ringing may disturb people in such places. The designed device works in dual band. It jams both the GSM 900 and GSM 1800 bands.
This project is mainly intended to prevent the usage of mobile phones in places inside its coverage without interfering with the communication channels outside its range, thus providing a cheap and reliable method for blocking mobile communication in the required restricted areas only with a specific time. Although they must be aware of the fact that nowadays lot of mobile phones which can easily negotiate the jammers effect are available and therefore advanced measures should be taken to jam such type of devices. These jammers include the intelligent jammers which directly communicate with the GSM provider to block the services to the clients in the restricted areas, but they need the support from the providers for this purpose.
This project a GSM, CDMA, 3G Mobile jammer was designed and built. The project was tested against the networks and has proven success with average range of 5m radius. Testing in different locations shows the dependent of the

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jamming range on the signal strength, for instance in low network coverage area of the base station the jamming range exceed 7m.In general the jamming attack was protected by network signal power, and having large power jamming device the Network will be jammed for sure, from this observation it can be concluded that the protection against jamming attack in the low coverage area was very weak and couldn't withstand the simplest jamming techniques. The main disadvantage of the mobile jammer is that the transmission of the jamming signal which is prohibited by law in many countries. Despite the legal issues the transmission of high power signal may affect the operation of some critical devices, such as hearing impairment hardware solution. These disadvantages will constrain the use of mobile jammer.

III.STATEMENT OF PROBLEM

Due to an always growing demand, several solutions are currently under investigation in order to improve the capacity of current mobile communication systems, among which the exploitation of space diversity. If uplink processing at the base station can be grounded on the availability of direct information about the concerned uplink channel (by the mean of a training sequence or blind methods), downlink processing encounters more severe difficulties: no information about the downlink channel is available at the base station prior to data transmission. We shall focus on that point and proceed through several steps. First of all, the problem statement will give us the opportunity to remind shortly how smart antennas can reduce CCI or handle space diversity multiplexing. Then notations will be introduced, and models of both uplink and downlink channels will be derived, highlighting their eventual similarities or differences, and the induced difficulties.

IV.SIGNIFICANCE OF THE PROJECT

Cell phone jammers are very useful to the society preventing from the disturbances in areas which require silence. We can restrict the communication network by using the cell phone jammers. Cell phone jammers prevent the students from carrying cell phones to the colleges or universities. As everything goes fine, it is very necessary to implement in all places that need silence such as University lecture rooms, worships, libraries, movie theatres, meeting rooms and others.

V.SYSTEM BLOCK DIAGRAM

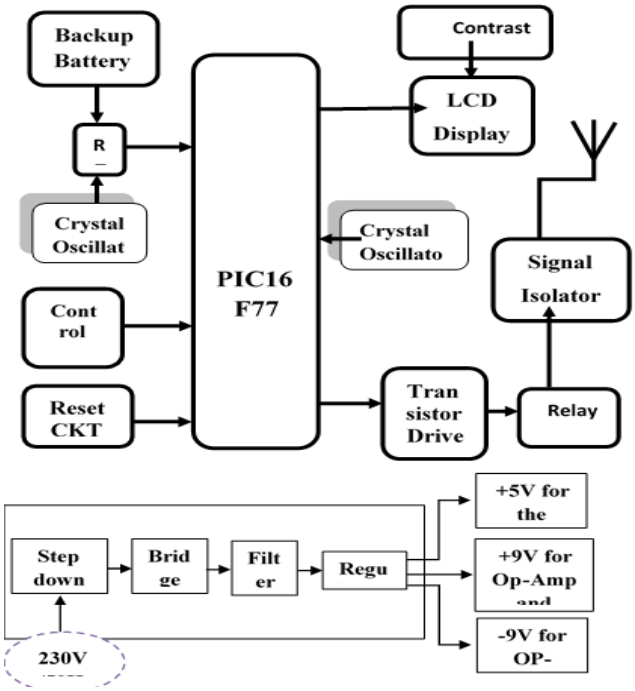

Fig 4.1: Block Diagram of the System

In this block diagram the first thing is the micro controller. It is use for controlling the all system. The oscillator role is similar to the role that heart plays in a human body. The LCD used to indicate the status of the system.RTC is real time clock. It is use for setting time and date. It will communicate with microcontroller through I2C (I to see) communication system.

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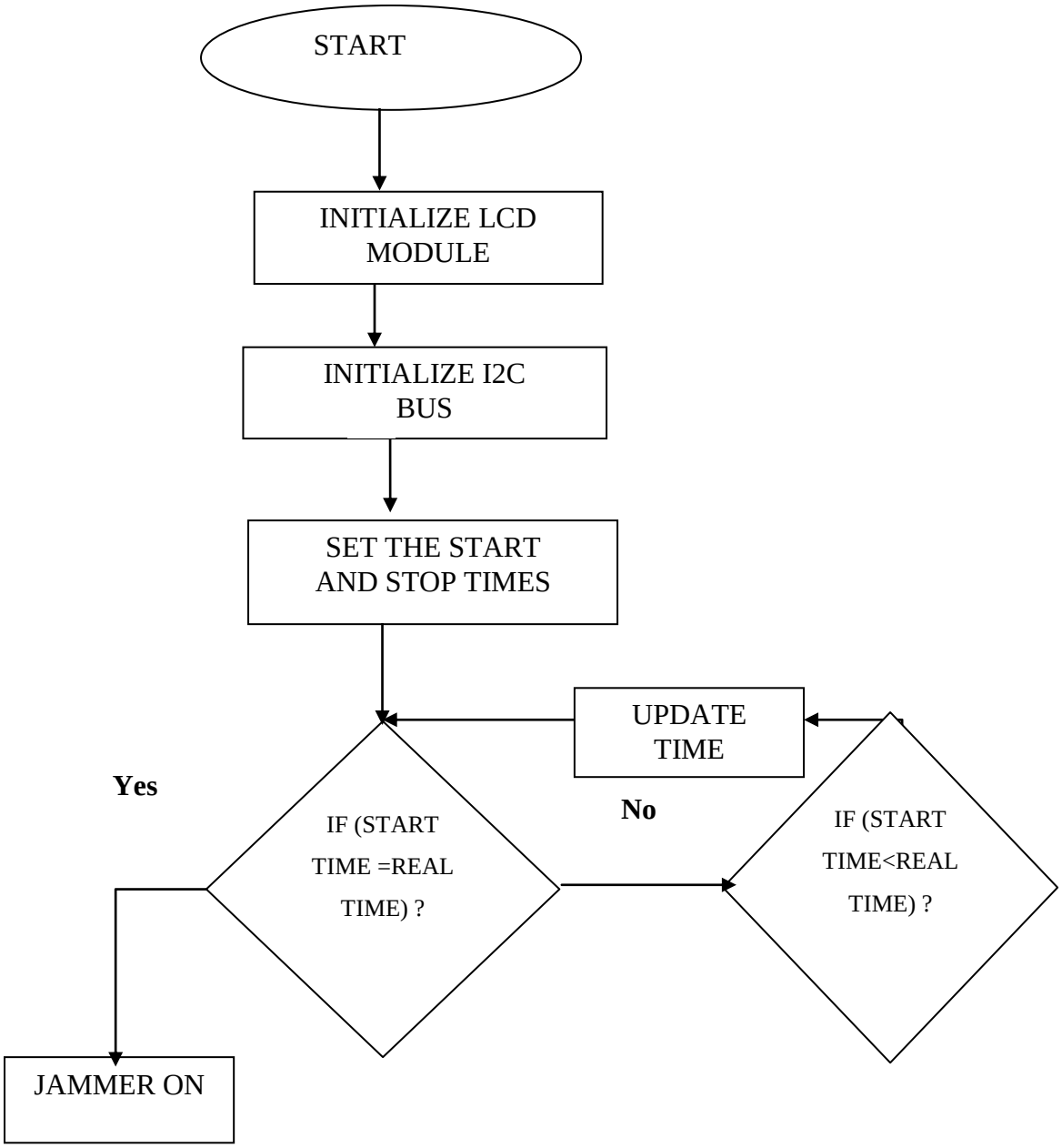
VI. FLOW CHART OF THE PROGRAM



VI. SOFTWRE CODE

```
//C program Using MicroC compiler
//We use RTC(DS1307) for clock and we use 16 x2  8-bit LCD for display.
//here to set a time we can use PORTA pin 2 by using “Button(&PORTA, 2,0,1)” instruction
//also to set alarm we use PORTA pin 3 by using “Button(&PORTA, 3,0,1)” instruction
//to increment and decrement the time we use PORTA pin 0 and 1 by using “Button(&PORTA, 0,0,1) and  Button(&PORTA, 0,0,1)” instruction
// we can use PORTD of pin 0 output for indicating the alarm on or making on mobile jamming relay through driving transistor(BC548)
//here we use two alarms b/c of making on and making off after some time
sbit LCD_RS at RB0_bit;
sbit LCD_EN at RB1_bit;
sbit LCD_D4 at RB2_bit;
sbit LCD_D5 at RB3_bit;
sbit LCD_D6 at RB4_bit;s
sbit LCD_D7 at RB5_bit;
```

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```
sbitLCD_RS_Direction at TRISB0_bit;
sbitLCD_EN_Direction at TRISB1_bit;
sbit LCD_D4_Direction at TRISB2_bit;
sbit LCD_D5_Direction at TRISB3_bit;
sbit LCD_D6_Direction at TRISB4_bit;
sbit LCD_D7_Direction at TRISB5_bit;
       int times=0;
       char txt[10];
       char txt2[20];
  int timet=0;
  int i=0;
int gettime(){
Lcd_Out(2,1,"Set Time");
Lcd_Cmd(_LCD_CURSOR_OFF);
while(1){
if(Button(&PORTA, 1,1,1)){
Delay_ms(250);
     times++;
IntToStr(times,txt);
Lcd_Out(2,7,txt);
}if(Button(&PORTA, 4,1,1)){
Delay_ms(250); times--;    IntToStr(times,txt);
Lcd_Out(2,7,txt);
}if(Button(&PORTA, 5,1,1)){
Delay_ms(250);
     return times;
   }
  }
}
void main()
{
Lcd_Init();
           ADCON1=0x06   ;
TRISA = 1;         // set PORTA to be input
  TRISD = 0;           // set PORTD to be output
  PORTD = 0;         // initialize PORTD
  CMCON |= 0x07;                                  // turn off comparators
  ADCON1 |= 0x0F;                                  // turn off analog inputs
while(1){
Lcd_Cmd(_LCD_CLEAR);              // Clear display
Lcd_Cmd(_LCD_CURSOR_OFF);         // Cursor off
Lcd_Out(1,1,"Cell Jammer");
   times=0;
do{
    //lcd.print("1");
timet=gettime();
    //lcd.print(time);
}while(timet<=0);
Lcd_Cmd(_LCD_CLEAR);              // Clear display
Lcd_Cmd(_LCD_CURSOR_OFF);         // Cursor off
Lcd_Out(1,1,"jaminnggggg");
Lcd_Out(2,1,"for");
IntToStr(timet,txt);
Lcd_Out(2,5,txt);
           PORTD = 1;
  for(i=timet;i>0;i--){
IntToStr(i,txt);
Lcd_Out(2,5,txt);
Delay_ms(60000);
  }
  //delay(timet*1000);
Lcd_Cmd(_LCD_CLEAR);              // Clear display
Lcd_Cmd(_LCD_CURSOR_OFF);
Lcd_Out(1,1,"offfff");
           PORTD = 0;
```

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VII. RESULT

As we tested our jamming device, the result is a full success. The device is able to jam the cell phone carriers. The effective jamming range is around 22 meters. This is more than what it was designed for. The reason is that in our calculations, we considered the worst case of having the cell phone close to the base station. It is expected that as the distance between the cell phone and the base station increases, the effective jamming distance will increase. This is due to the fact that the amount of power reaching the cell phone from the base station decreases as the cell phone moves farther from the base station. The Figure below shows the results of simulation and hardware capture of IF sections.

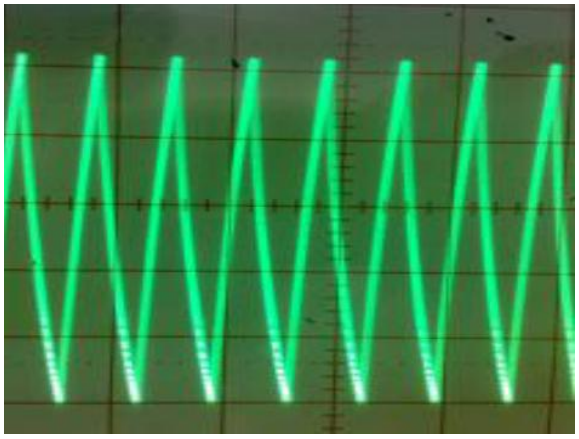

Fig7.1: Generated triangular waveform.

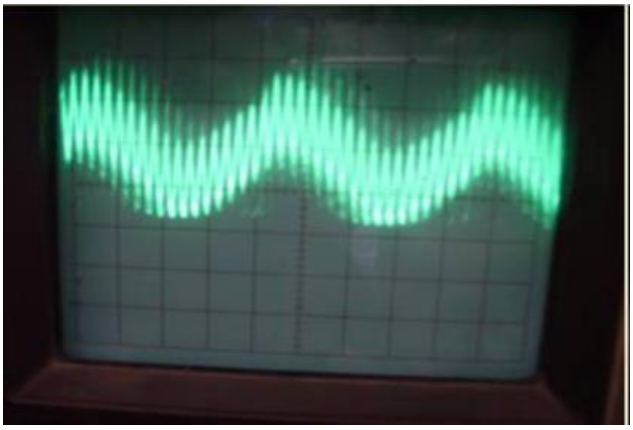

Fig 7.2: 3.5 vTunning signal

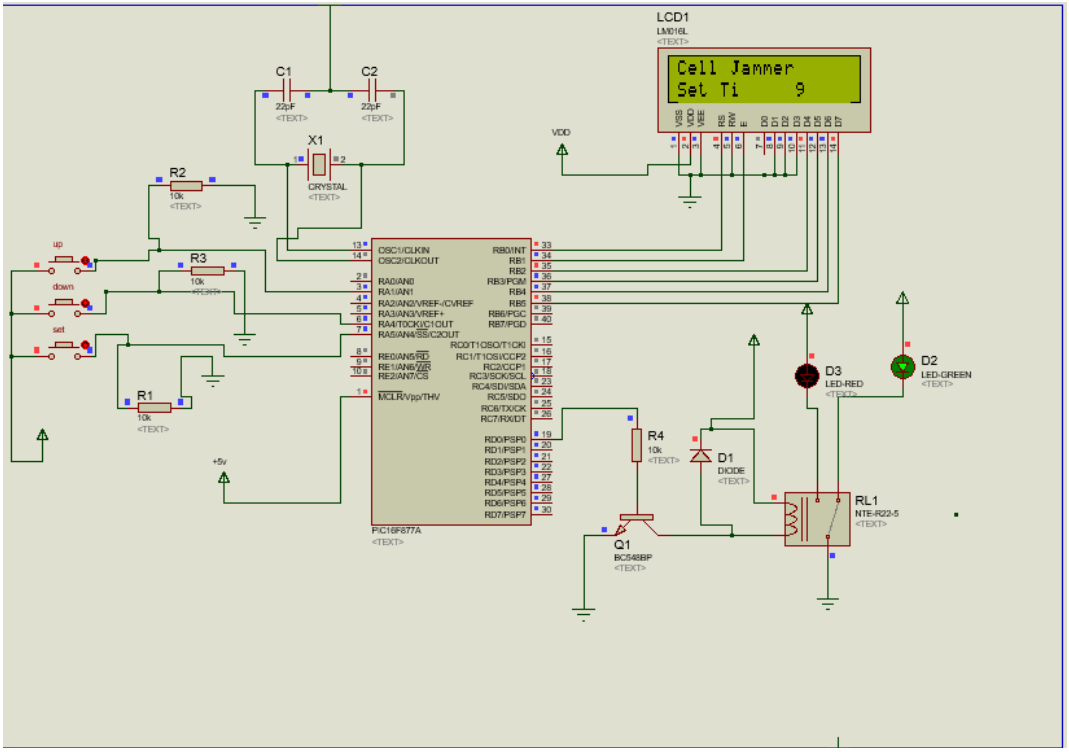

Fig6.3 : simulated circuit diagram(final block diagram's)

VIII. CONCLUSIONS AND DISCUSSION

In this project, we designed a device that stops phone ringing. This device could be used in places where ringing is not desired at specific times, as these ringing may disturb people in such places. The project was designed and implemented according to the following plan:

- We started by studying the jamming techniques, and mobile signal system to find the best jamming method. The system block diagram was also specified in this stage.

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- We searched for components that are needed for building this device, and specified the main components which were:
- For Microcontroller section, we need PIC, LCD, RTC, oscillator, relay and buttons
- For RF section, we needed VCO's that operate at the needed bands, power amplifier, and antennas.
- For the IF section, we used 555timer, Zener diode, mixer and some discrete components (resistors and capacitors).
- The schematic was drawn and some simulations for the IF-Section were performed. Then, we started to design the layout using Orcad software.
- All the IF-components were bought from local companies. Then, the IF-section was built and tested.
- After that, we began to search for the RF-components (VCO and the board) in the local market. Since we lost to collect these IC's from the local market, we had to searching them from electronics materials (from old Nokia mobile) but most are failed. We still searching the devices

We hope that this project will be useful for the community where such jamming devices are needed.

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BIOGRAPHIES

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[2]**Mr Misay.Mangesthu** working as a Lecturer & Head, EETM Department, FTVETI, AA Ethiopia. He holds B.Sc. M.Sc. He is also very good Teacher, Administrator. His area of interest in research is Electronics Communication, especially signal & image processing etc.

[3]**Mr. Mogos Chere, Mr Birhanu Alebzchew, Mr Wondorsen.Tegegnare** the PG students in branch of ECTM, EET Department, FTVTI, AA, Ethiopia. This is the PG thesis of them. We implemented hardware as well as software parts for use of Ethiopians as best our knowledge. Our area of interest is Electronic Devices & Communication topics.