Signal jammer reduces wireless fidelity network and global system in local environment

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Abstract. Cellular networks are a way of long distance communication without the use of cables, this system is a modern style of communication that was previously communication using a landline-based telephone. Cell phones (cellphones) or cell phones (cellphones) are electronic-based telecommunications devices that have the exact same basis as telephone telecommunications devices using cables or wireless wireless. The use of cellular or wireless phones is very useful, but in certain conditions their use can be limited because it can interfere with people around him such as the implementation of worship, examinations, meetings and so forth. To answer complaints about how to reduce cell phone and wireless signals, a tool that is able to deactivate GSM and Wi-fi cell phone signals at certain radii will use a jammer, a device that works by emitting full noise signals at 900 MHz frequency banks, 1800 MHz and 2700 MHz, so that the communication device cannot be used until the time limit and the distance of the radius that reaches the communication device. The results of this study have been successfully carried out by deactivating cell phone and wireless signals at a maximum distance of 7 meters from the jammer.

1. Introduction

The country of Indonesia is one of the many countries that use the most information and communication technology in the world, in 2014 the level of mobile phone ownership reached 84%, this does not include other mobile communication information technology devices [1]. Cellular networks are a way of long distance communication without the use of cables, this system is a modern style of communication that was previously communication using a landline-based telephone. Cellular telephone (cellphone) is an electronic-based telecommunications device that has the exact same base as a telephone telecommunications device using a cable or what is known as wireless wireless [2]. In terms of health, cell phones have one source of electronic radiation, this radiation has side effects for its users such as oxidative stress on the body [3]. For certain purposes a room or a restricted location is very necessary to reduce the signal with the aim that there are no disturbances in the location such as the implementation of worship, speeches, learning or activities that require participants not to use communication tools, this term is known as jamming. Jamming can be said as a way to eliminate or block electronic communication signals from a transmitter of another signal known as a jamming signal, this jamming signal has the same frequency as the transmitter but has stronger energy, so the receiver only detects a jamming signal that is able to knock out electronic
communication that is using the radio as a medium for sending information [4]. At this time the software continues to experience updates by looking at the aspects of the benefits of using the software so that a higher level of software provides a better impact and high benefits [5],[6].

This jammer signal damper tool can be implemented in certain spaces with the aim that the room is free of signals that can interfere with indoor activities, the existence of this tool is able to reduce the signal of the cell phone owner or Wi-fi network to the time limit allowed, such as worship space such as mosques or mushalla so that with the proper functioning of this tool the worship can be carried out properly and dull from the interference of the communication device signal. To answer complaints about how to reduce cellular and wireless telephone signals, this research will design a device capable of deactivating GSM and Wi-fi cell phone signals at certain radii using a jammer, ie the device works by emitting a full noise signal at the 900 MHz frequency bank, 1800 MHz and 2700 MHz, so that the communication device cannot be used until the time limit and radius distance that reaches the communication device and makes the automation process of the signal damp jammer so that on a certain schedule the tool functions and is active or inactive. This technology is a digital technology whose implementation is in mobile communication, such as cellular phone users.

Likewise, the development of communication through Short Messaging Service (SMS) which is one of the features of the Global System for Mobile (GSM) cellphone system [7]. GSM technology uses microwaves in sending signals that are grouped by time, so that the information signal sent is confirmed to the recipient. GSM is the most widely used communication tool by humans throughout the world, this technology operates in the frequency range of 900 MHz and 18800 MHz range [8]. The service system in this GSM technology uses data, voice, or it can also be video so that users who are connected to each other can communicate remotely without having to have a physical meeting in person. Until now a communication tool in the form of a GSM telephone was developed primarily for voice communication and data handling at 9600 bps and is capable of operating in areas with a frequency of 900 MHz [9]. Jammer can be used and works well to block cellphone signal on GSM 900/1800/1900 MHz, the range can be done up to 10 meters, this range can increase or even decrease if used in different conditions, for example in the hallway, between rooms even when used in open spaces, this is because the power factor received by cell phones varies [4].

Wifi is a set of standards used for wireless local area wireless networks based on the latest IEEE 802.11 standard specifications of the 802.11a or 802.11b specifications such as 802.11g, currently under preparation, the latest specifications offer more quality improvements Wi-fi-based network services, ranging from wider and farther reach to transfer rates [10]. In 2020 the development of wireless-based technology increased to the fifth generation of 5G, the generation of 5G telecommunications was followed by a very large level of communication (massive) where the number of services / machines connected to the internet reached 50 billion while the world population is currently 5 billion, so in the internet network population of the world if a ratio of 1:10 is made [11].

2. Materials and methods

2.1. Work Procedure and Tool Design
This design was made to simplify the process of designing an Arduino-based Signal Jammer. The Signal Jammer circuit consists of three parts namely the input part, the control part, the display part. The following is a work procedure and tool design presented in the research that has been conducted.
Figure 1. Work Procedure

From Figure 2, the following sections are explained in the series:

a. Arduino
   In this section arduino can function as a single-board micro-control that is open source, derived from the wiring platform, designed to facilitate the use of electronics in various fields.

b. Relay
   This relay is a device that is able to work based on electromagnetism to drive a number of arranged contractors or an electronic switch that can be controlled from other electronic circuits by utilizing electric voltage as a source of energy it receives.

c. LCD 12C
   This is one of the types of electronic display made with CMOS logic technology that works without producing light, but reflects the light around it to front-lit or transmits light from back-lit. LCD (Liquid Cristal Display) also functions as a data viewer in the form of letters, numbers, and graphic characters.

d. RTC DS 1302
   This section is a component needed to provide information about time, in the form of seconds, minutes, months and years.

e. Jammer Isolator
   This tool is a device that can inhibit cellular networks by emitting signals at the same frequency with high power.

2.2. Flowchart Circuits and Signal Jammer Simulation

The design and work of the tools carried out in this study can be seen in Figure 3 and the jammer signal simulation can be seen in Figure 4. In Figure 3 it can be seen that when the system starts running from Figure 3 it is seen when the program is input that the relay that functions as a switch will be ON (On) automatically based on the Real Time Scheduling (RTC) Scheduling process that displays the prayer times on the LCD. Then the relay input in the form of a Jammer will block all GSM and WIFI networks that enter the area for 5-10 minutes. After the prayer time is finished, the jammer will turn off again, for more details, see the following figure:
In jammer jamming, all components are connected to each other and can be controlled using a Timer based on the prayer times that have been set, where the RTC is used as input so that the Signal Jammer controller gets scheduling, this scheduling functions so that Arduino Uno can be programmed in real time and scheduling data can be displayed on the I2C LCD.

3. Results and discussion

3.1. Relay Module Circuit.
This module relay circuit is an electronic component (electronic) which consists of two main parts, namely electromagnet (coil) and mechanical (a set of contact switches / switches). Relay is a switch (switch), this relay also uses the electromagnetic principle to move the switch contacts so that with a small electric current (low power) can conduct electricity that has a voltage with a high current. The VCC pin on the Relay pin is connected to the V5 pin on Arduino, the Gnd Relay pin to the Arduino Gnd pin and the IN2 Relay pin to Arardino 7 for more details can be seen in Figure 5 below.

3.2. Components of a Real Time Clock (RTC) Circuit.
RTC is an electronic clock in the form of a chip that is able to calculate time, ranging from time in seconds to units of years that can be done accurately and maintain and store time data in real time. Because the time is stored in real time, then after the countdown process is done, the data output is directly saved or sent to another device via the system interface. This RTC chip is often found on a PC motherboard usually located close to the BIOS chip. We know that all computers use RTC because it functions to store the latest clock information from the computer in question, RTC is equipped with a battery as a power supply on the chip, so the clock will remain up-to-date even if the computer is
turned off. RTC is considered quite accurate as a timer because it uses a crystal oscillator. In research conducted using the DS3234 RTC chip. RTC DS1202 (Real Time Clock) is an IC chip that has a function to calculate the time that starts from seconds, minutes, hours, days, dates, months to years with a size to maintain or store time data that has been turned ON. The module has its own power source such as a clock battery, as well as the accuracy of the time data displayed using an external crystal oscillator. The pins used on RTC DS1302 are VCC, GND, CLK, DAT, RST connected to VCC Pins, GND, -9, -10, -11. At Rtc the VCC pin is connected to pin 5V on arduino uno, Gnd Rtc pin to arduino Gnd pin and CLK Rtc pin to arduino 9 pin, DAT pin to 9 arduino pin, RST pin to arduino 11 pin, as shown in Figure 6.

**Figure 6.** Results of the RTC (Real Time Clock) circuit

### 3.3. Rangkaian LCD 12 (Liquid Crystal Display)

LCD is a type of display that uses Liquid Crystal as a reflection medium. LCD is also often used in designing tools that use microcontrollers. This LCD can function to display a sensor value displaying text, or display a menu on the microcontroller application, so it depends on the commands given to the code contained in the microcontroller program. The LCD is composed of points of light made of a liquid crystal for each point of light. Although referred to as a point of light, but this liquid crystal does not emit its own light, the light source received in an LCD comes from a white fluorescent lamp behind the liquid crystal arrangement. The pins on the I2C LCD used by VCC, GND, SDA, SCL are connected to pins V5, GND, SDA, SCL on the arduino uno pin.

**Figure 7.** The I2C LCD circuit results

### 3.4. Overall Toolkit.

The overall sequence of Signal Jammer Gsm and Wifi Network Reducer, where all components are connected to each other and can be controlled using a Timer based on prayer time, where the RTC is used as input so that the Signal Jammer controller gets scheduling. This scheduling functions so that Arduino Uno can be programmed in real time and the scheduling data can be displayed on the I2C LCD.

### 3.5. Testing Procedure.

When all systems are successful and completed, the next step is testing the system, where the RTC is used as input so that the Signal Jammer controller gets scheduling, this scheduling functions so that
Arduino Uno can be programmed in real time and the scheduling data can be displayed on the LCD I2C. The program here, the authors make by taking data samples of 5 time periods. And at each sample period 5 time the jammer tool will work for 5 minutes, after 5 minutes the jammer is on then the jammer will automatically be turned off and the signal dampening tool will return to normal function.

**Table 1. Tool test results**

| Testing | Jammer Processing Time |
|---------|------------------------|
|         | On  | Off   |
| 1       | 05 : 10 | 05 : 40 |
| 2       | 12 : 35 | 13 : 05 |
| 3       | 15 : 50 | 16 : 20 |
| 4       | 18 : 40 | 19 : 10 |
| 5       | 19 : 50 | 20 : 20 |

### 3.6. Jammer Operation.

Cellular jammers block cell phone use by sending radio waves along the same frequency that cellular phones use, this causes considerable interference with communication between cell phones and the signals emitted to make cellphones unusable or networks blocked until the time limit is allowed to reactivate. In most retail mobile phones, the network will only appear out of reach. Most cellphones use different bands to send and receive communications from the tower (called full duplex). Jammers can work well by interrupting the telephone up to the tower frequency or tower to telephone frequency. Smaller handheld models block all bands from 800MHz to 1900MHz within 30-feet (7 meters).

**Table 2. Test Results dampen cellular and wi-fi signals**

| Trial | Range  | Information |
|-------|--------|-------------|
| 1     | 1 meters | Active     |
| 2     | 3 meters | Active     |
| 3     | 5 meters | Active     |
| 4     | 7 meters | Active     |
| 5     | 8 meters | Not Active |

Based on the testing tools on the prayer schedule, the relay that functions as a switch that outputs a jammer output will be On when entering the Fajr Prayer Times, Dzuhur, Ashar, Maghrib, Insya and will turn off all networks that enter within a period of 5 minutes and after the Prayer Time is complete then the Jammer will automatically be turned off and the tool will run normally.

Based on the testing of the range of equipment above, the Jammer Mini Portable Cell Phone is tested 5 times.

1. The first experiment was carried out at a distance of 1 meter so the jammer was still responding and could still block all networks.
2. The second experiment was carried out at a distance of 3 meters so the jammer was still responding and could still block all networks.
3. The third try is done at a distance of 5 meters so the Jammer is still responding and can still block all networks.
4. The fourth experiment was carried out at a distance of 7 meters so the Jammer was still responding and could still block all networks.
5. The last experiment was carried out at a distance of 8 meters so the jammer could not block the network.
   Based on the testing of the Signal Jammer Silencer and GSM Network Damper Tool, the device can block the incoming network according to the prayer times as in Table 4.1 above, so the cellphone cannot receive incoming calls according to the time of the current signal attenuation.

4. Conclusions
   After designing and realizing the Signal Jammer Reducer GSM and Wifi Network systems, testing of the equipment is carried out, both in the form of blocks and as a whole. Then it can be concluded that the tool that has been made can work well as expected. Relay that functions as an input eases output in the form of a Signal Jammer that dampens the network in the area at a distance of less than 8 meters in less than 30 minutes.

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