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# REVIEW PAPER ON CELL PHONE COMMUNICATION

**Nishi Singh Parmar[1], Komal Yadav[2], Kajal Lohia[3]**

## ABSTRACT

*New phones allow users to do much more than hold phone conversations. Presently, we are starting to see the third generation of the cellular phones coming to the market. Cellular telephony is one of the fastest growing technologies on the planet. Today's mobile phone can perform more functions like:- Storing contact information, Make task lists, Settings of remainders, Calculator, Camera, Send/receive email, Send/receive pictures, Send/receive video clips, Internet can also be used on phones, Play games, Connectivity from other devices via Bluetooth or data cabel. So this paper contains the information about the working of cell phones i.e. how a cell phone actually make calls.*

***Keywords: Cellular Technology, Mobile Phones,***

## I. INTRODUCTION

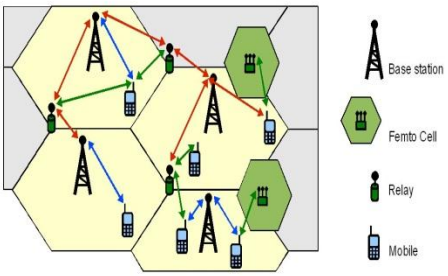
Cellular system developed to provide mobile telephony across the whole globe i.e. Telephone access can be possible, anytime& anywhere.

First mobile telephone system was developed and inaugurated in the U.S. in 1945 in St. Louis, MO.

That was a simplified version of the system used today.

### A) Cellular Concept

The core idea that led to today's system was the cellular concept. Under this cellular concept the multiple lower-power base stations that service mobile users within their coverage area and handoff users to neighboring base stations as users move. Together base stations tessellate the system coverage area.Thus, instead of one base station covering an entire city, the city was broken up into "cells", or smaller coverage areas.




Every cell has its own lower-power base station.User phones in one cell communicate with the base station in that cell.

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## II. WHY THE NAME CELLULAR?

The cells were made or designed "Hexagonal" in shape and the lower power base station antenna's chosen was omnidirectional i.e. they transmit in all $360^0$ . This arises a problem that the base station has the circular coverage area, user located at quiet greater distance from antenna receives weak signal.

Since the network resembles cells from a honeycomb so, the name "CELLULAR" was used to describe the resulting mobile telephone network. Under this cellular network when a user moves from one cell to another than at some point it's signal is weak from antenna in one cell and higher signal will be available from the antenna from the other cell.

**B) Multiple Access Method:**

The number of user in one cell communicates with the same tower or antenna. For this multiple access some methods has been adapted known as multiple access method. The three methods are as follows:

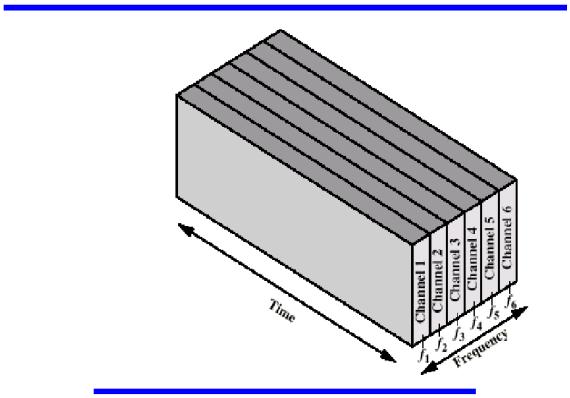
I. Frequency Division Multiple Access (FDMA)

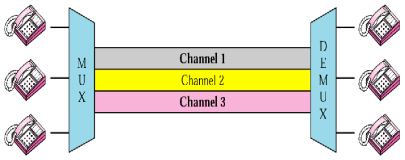
II. Time Division Multiple Access (TDMA)

III. Code Division Multiple Access (CDMA)

**C )FDMA:**

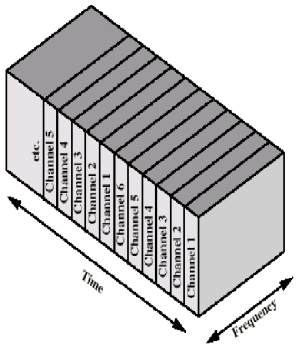
Each transmitter (user) transmits to the base station using radio waves in its own sub band. The band of frequency is broken up into smaller bands, i.e., sub bands. In FDMA, we assume that a base station can receive radio signals in a given band of spectrum, i.e., a range of continuous frequency values.




**D)TDMA**:

In TDMA scheme, base station does not split up its allotted frequency band into smaller frequency sub bands. Rather it communicates with the user's one-at-a-time, i.e., "round robin" access.Time is divided in to up into time slots, i.e., small, equal-length intervals. Each user in TDMA scheme is assigned one slot per frame. This slot assignment stays fixed as long as the user communicates with the base station (e.g., length of the phone conversation).

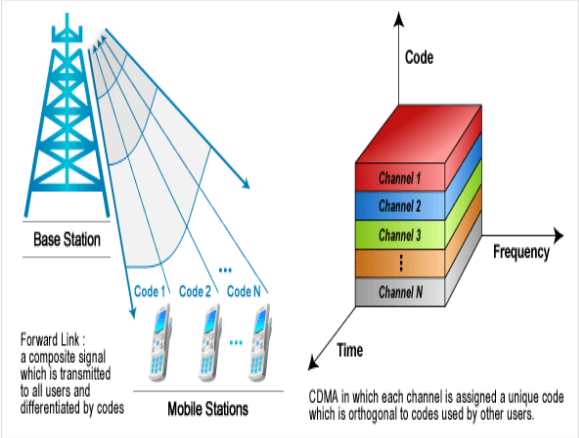



**E) CDMA:**

CDMA is a more complicated scheme. Here all users communicate to the receiver at the same time and using the same set of frequencies. This means they may interfere with each other. The system is designed to control this interference. A desired user's signal is deciphered using a unique code assigned to the user. There are two types of CDMAmethods

i) Frequency hopping, and

ii) Direct sequence.




## II. COMPLETE CELLULAR NETWORK

Complete cellular network consists of MSC (Mobile switching centers) which control and coordinate the cellular network. They serve as intermediary between base stations that may be handing off users between each other. Base stations communicate with each via the MSC. MSC keep track of cell phone user subscription & connects to the wired phone network (rest of the world).

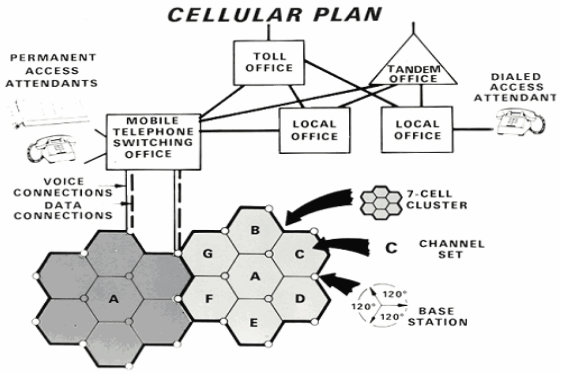
A group of local base stations are connected (by wires) to a mobile switching center (MSC). MSC is connected to the rest of the world (normal telephone system). MSC's have all the information's of all the base stations.

## III. THE AMPS SYSTEM

The AMPS(Advance Mobile Phone System) is a standard for analog signal cellular telephony. It is based on the Electromagnetic radiation spectrum; it allocates frequencies ranges from 800MHz to 900MHz. Each service provider can uses half of the 824MHz to 849MHz for receiving signals i.e. when one user calls to other user & half of the frequency band

from 869 to 894MHz is used to transmitting to cell phones. These bands are divide into sub-bands of 30KHz called Channels. It is further classified into two types:-

- The sending channels is called the **Forward** channel, &
- The receiving channel is called the **Reverse** channel.

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