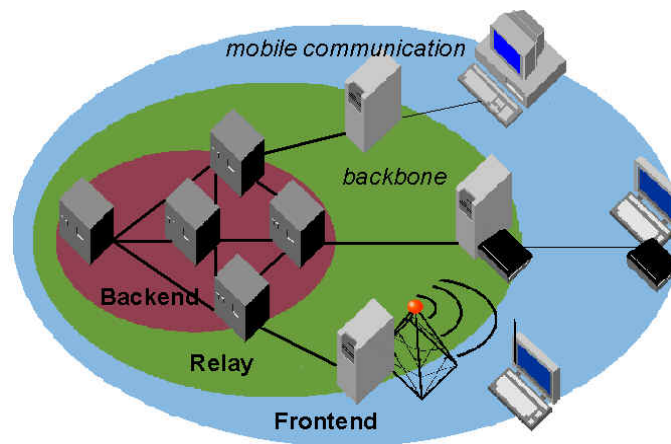




A Paper Presentation on

THIRD GENERATION (3G) WIRELESS MOBILE COMMUNICATION



By

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Abstract

At the start of the 21-century the wireless mobile communications are going to witness unprecedented growth fuelled by an information explosion and a technology revolution in the form of Third Generation (3G) mobile wireless communications. The first generation wireless mobile systems were analog and insecure. The present second generation systems are digital, secured but limited to a certain geographical area due to different technology standards by different countries. While these proposed 3G systems are sophisticated, globally compatible and offer significant improvement of data and multimedia capabilities.

In this paper we discussed the motivating factors and technological trends that are going to be used in these expected future systems and also project a scope for the systems beyond 3G.

Keywords: Wireless Mobile communications, 3G Systems, multimedia.

1. Introduction

At the start of the 21-century the wireless mobile communications are going to witness unprecedented growth fuelled by an information explosion and a technology revolution in the form of Third Generation (3G) mobile wireless communications. The following information gives the details of all generations.

1.1. First generations:

First generation uses the analog signals that convert the sound of our voice into electrical signals that flows through the wires at the other end convert this signal back into sound. The main disadvantage of first generation is that the data is insecured i.e.; hijacking of information is possible.

1.2. Second generations:

Most of the second generation systems were individually developed by different countries and are incompatible with each other. Some of the second generation systems and their relative occupation in the present worldwide mobile industry can be seen from the following data

Global System for Mobile GSM)	-----58%
Code Division Multiple Access (CDMA)	-----14%
Time Division Multiple Access (TDMA)	-----9%
Other 2G Systems	-----10%
Analog Systems	-----9%

1.3. Evolution towards 3G:

At the start of the projects it was initially hoped that a unique air interface standard would be desirable worldwide and a project was launched known as Universal Mobile Telephone Services (UMTS), which is proposed to operate in 1800-2200 MHz band.

For most 2G systems based on GSM or TDMA (Time Division Multiple Access) standards, the evolution of 3G is planned through the Enhanced Data for GSM Evolution (EDGE) standard. For new “green field” service providers, the

UMTS systems will likely be used and for systems based on IS-95CDMA systems, the evolution is based on the CDMA-2000.

The concept (3G) initiated by International Telecommunications Union (ITU) and fuel by projects like International Mobile Telecommunications (IMT-2000) and 3 Generation Partnership Projects (3GPP-1 and 3GPP-2), presently these systems are under vigorous development and are going to be deployed within a short period in various regions round the people.

2. Technical aspects

Three main aspects drive the proposal, evolution, harmonization and technical activities of these 3G systems:

1. Operators requirements
2. Manufacturer requirements
3. Subscribers requirements

2.1. Operator's requirements:

From operator's point of view the important requirement is to minimize their 3G investment risk by ensuring smooth and compatible evolution path from existing infrastructure, without abandoning the current infrastructure, replacing it with new incompatible system.

2.2. Manufacturers requirements:

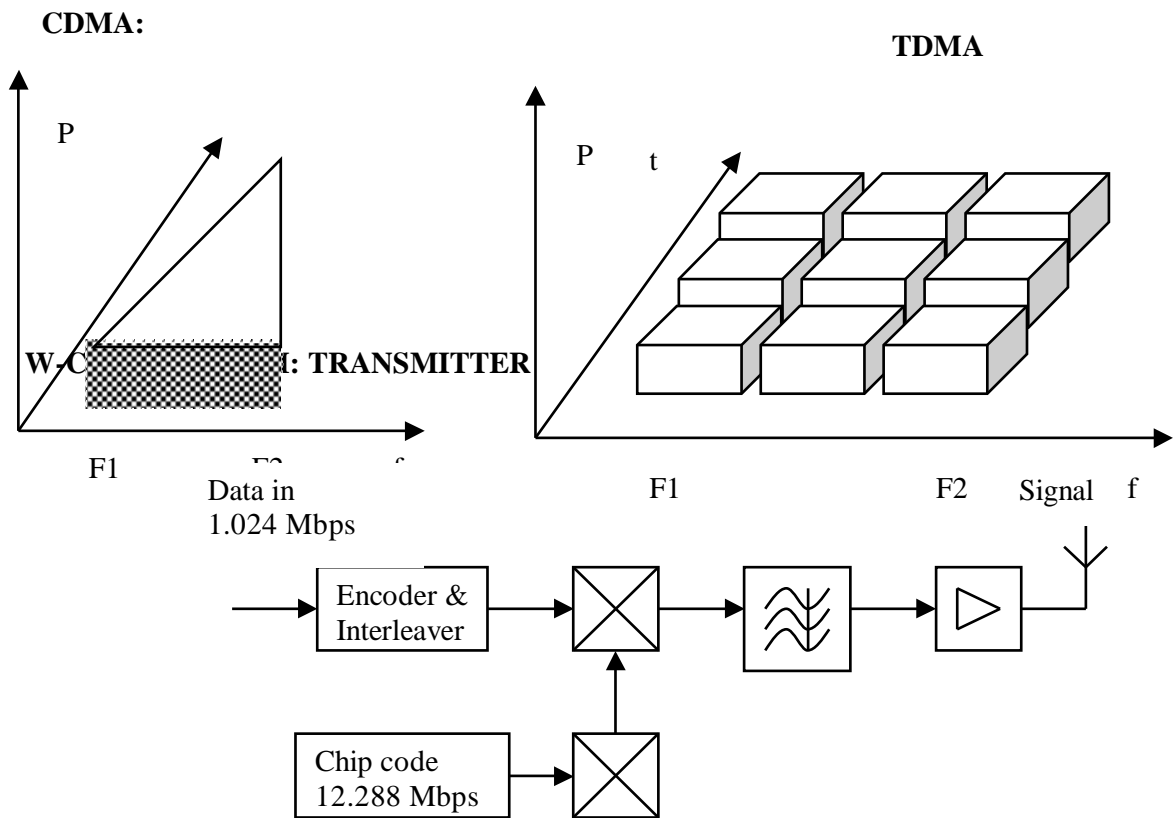
From manufacturer view point the convergence of the global standard is attractive because it eliminates costly duplication of R&D efforts associated with multiple standards and reduces the development cost.

2.3. Subscribers requirements:

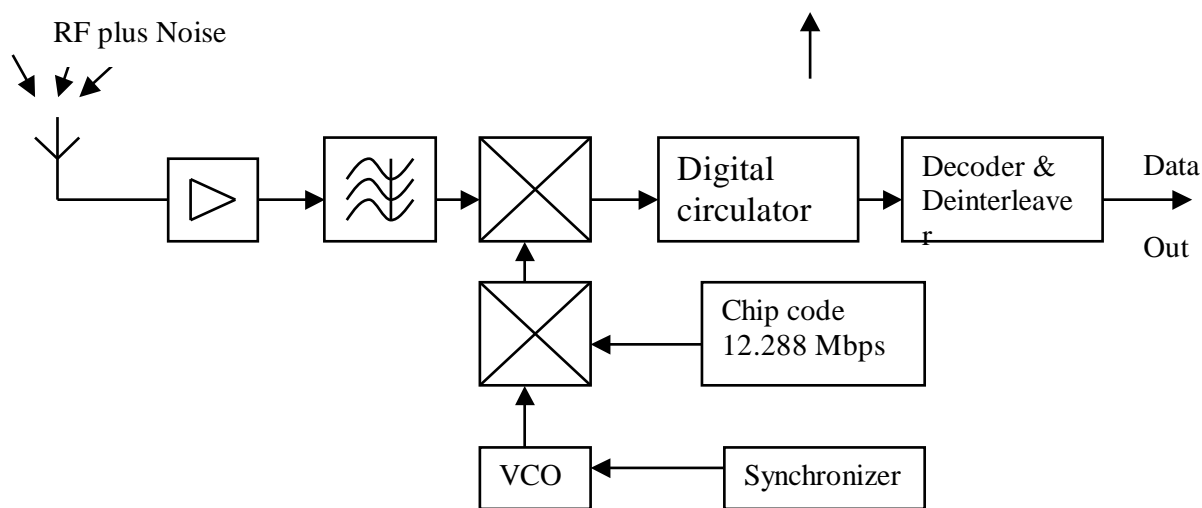
From subscriber stand point, the general consensus is that a harmonized standard will maximize the customers 'ability to roam with their services across the regions, countries and systems.

As these 3G systems created much interest in all, a large number of proposals came from different countries and technical groups round the globe. A few these proposals are listed down here, which are under vigorous development .A brief discussion is provided about each topic separately.

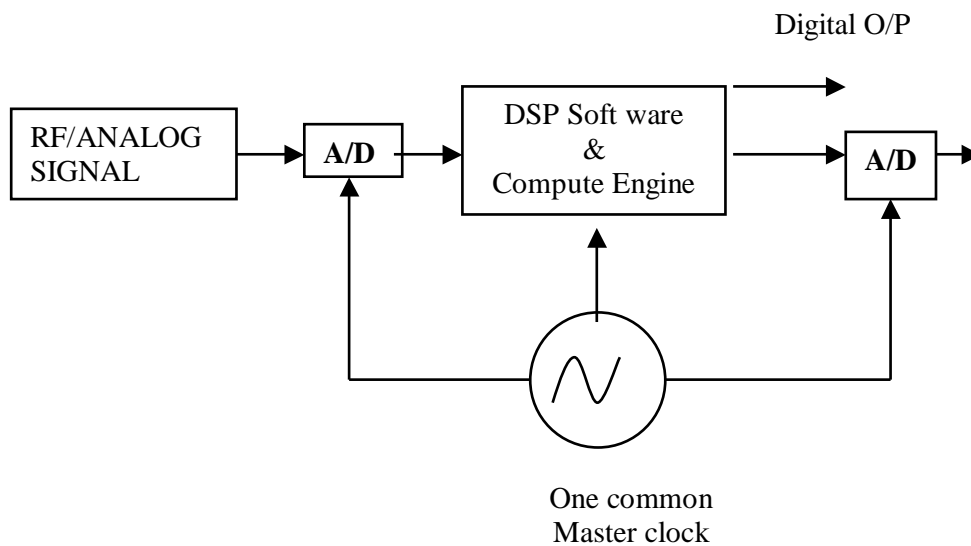
- Wideband Code Division Multiple Access (W-CDMA)
- Software Defined Radio (SDR)
- Intelligent Antennas
- Quality of Services (QoS)
- Radio Resource Allocation (RRA)



RECEIVER



A SDR TRANSCEIVER WITH A SINGLE MASTER CLOCK



3. CONCLUSION

With less than 50 years of commercial history, wireless mobile communications have already changed the way people communicate with each other. Whole the progress has been impressive, much more is yet to come that will revolutionize communications, as we know it, leading eventually to communicating with anyone or any device at any place and any time.

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