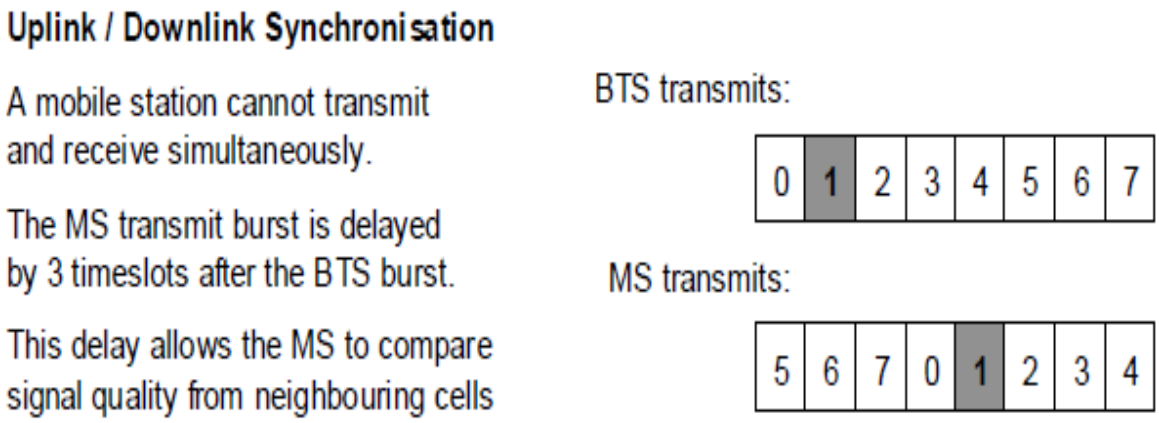
CHAPTER TREE: DISCUSSION OF RESULT.

The BSC manages all the radio-related functions of a GSM network. It is a **high-capacity switch** that provides functions such as MS handover, radio channel assignment and the collection of cell configuration data. A number of BSCs may be controlled by each MSC.

GSM 900

The original frequency band specified for GSM was 900 MHz. Most GSM networks worldwide use this band. In some countries and extended version of GSM 900 can be used, **which provides extra network capacity.** This extended version of GSM is called E-GSM, while the primary version is called P-GSM.



Half rate TCH is not generally implemented. The delay between uplink and downlink is generally less than 3 timeslots due to Timing Advance.

SECOND GENERATION (2G):

In 1991, a second-generation mobile network was launched by Radiolinja based on the GSM. It's a digital network, and providing a reliable & secure communication channel was the 2G network's primary motive. Because of transmitting wireless transmission of 2G mobile network was known as the Global System for Mobile Communication. 2G network also has some features and limitations.

Cell phones received their first major **upgrade** when they went from 1G to 2G. The main difference between the two mobile telephone systems (1G and 2G), is that the **radio signals** used by 1G network are analog, while 2G networks are **digital** . Main motive of this generation was to provide secure and reliable communication channel. It implemented the concept of **CDMA** and

GSM. Provided small data service like SMS and MMS. Second generation 2G cellular telecom networks were commercially launched on the GSM standard in Finland by Radiolinja (now part of Elisa Oyj) in 1991. 2G capabilities are achieved by **allowing multiple users on a single channel** via multiplexing. During 2G Cellular phones are used for data also along with voice. The advance in technology from 1G to 2G **introduced many of the fundamental services** that we still use today, such as SMS, **internal roaming**, conference calls, call hold and billing based on services e.g. charges based on long distance calls and real time billing. The **max speed** of 2G with General Packet Radio Service (GPRS) is 50 Kbps or 1 Mbps with Enhanced Data Rates for GSM Evolution (EDGE). Before making the major leap from 2G to 3G wireless networks, the lesser-known 2.5G and 2.75G was an interim standard that bridged the gap

FEATURES:

- Digital technology.
- Small data services like SMS and MMS (Multimedia Message System).
- Roaming was possible.
- First internet system with poor data rate.
- Better voice call.
- Conference calls are allowed.
- Comparatively enhanced security.
- Data speed up to 64 Kbps.
- 30 to 200 kHz bandwidth.

LIMITATIONS:

- Restricted mobility.
- Data rate low.
- Fewer features.
- Less hardware capability.
- User numbers are limited.

Features	1G	2G
Evolution	1970	1980
Introduced/deployment	1979	1991
Technology	AMPS, TACS	GSM
Technology Behind	Analog cellular tech	Digital cellular tech
Frequency	800-900 MHz	1.8 GHz
Internet Service		Narrow band
Net Speed	2.4 Kbps	64 Kbps
Application/service	Voice call	Voice call, short message

Bandwidth	NA	25Mhz
Channel bandwidth		200 kHz
Core network	PSTN	PSTN
Data rate	2kbps	14.4.-64 kbps
Handoff	Horizontal	Horizontal
Enhancements:		GPRS and EDGE
Peak data rate:		384 kbps with EDGE
Multiplexing	FDMA	TDMA,CDMA
Access system		TDMA,CDMA
Advantage		Multimedia features (SMS & MMS) Internet access and SIM introduced
Types of switching	circuit	2G: circuit 2.5G circuit & packet.

GSM 1800 CHANNELS

GSM-900 and GSM-1800 are used in most parts of the world: Europe, Middle East, Africa, Australia and most of Asia. In South Americas it is in Costa Rica (GSM-1800), Brazil (GSM-850, 900 and 1800), Guatemala (GSM-850, GSM-900 and 1900), El Salvador (GSM-850, GSM-900 and 1900).

GSM-900 uses 890–915 MHz to send information from the mobile station to the base station (uplink) and 935–960 MHz for the other direction (downlink), providing 124 RF channels (channel numbers 1 to 124) spaced at 200 kHz. Duplex spacing of 45 MHz is used. Guard bands 100 kHz wide are placed at either end of the range of frequencies.

In some countries the GSM-900 band has been extended to cover a larger frequency range. This 'extended GSM', E-GSM, uses 880–915 MHz (uplink) and 925–960 MHz (downlink), adding 50 channels (channel numbers 975 to 1023 and 0) to the original GSM-900 band. The GSM specifications also describe 'railways GSM', GSM-R, which uses 876–915 MHz (uplink) and 921–960 MHz (downlink). Channel numbers 955 to 1023. GSM-R provides additional channels and specialized services for use by railway personnel.

All these variants are included in the GSM-900 specification. GSM-1800 uses 1710–1785 MHz to send information from the mobile station to the base tranceiver station (uplink) and 1805–1880 MHz for the other direction (downlink), providing 374 channels (channel numbers 512 to 885). Duplex spacing is 95 MHz.GSM-1800 is also called DCS (Digital Cellular Service) in the

United Kingdom, while being called PCS in Hong Kong (not to mix up with GSM-1900 which is commonly called PCS in the rest of the world.)