BASE STATION SYSTEM COMPONENTS:
The Base station system handles all radio interface related functions for the wireless network. The BSS consists of several to many radio base stations, a base station controller, Transcoder controller. The radio equipment required to serve one cell is typically called a base transceiver system. A single radio base station might contain three base transceiver systems which is used to serve a cell site that consists of three 120 degree sectors or cells.

![Diagram](image)

**Fig 2.3** components of base station system

Typical CDMA wireless system
The base station controller functions as the interface between mobile switching centre and packet core network and all the radio base stations controlled by BSC. The BSC system provides timing signals and connectivity to every subsystem within it and computer interfaces to the entire system. The BSC will supply signaling towards the MSC using message transfer part protocol to transfer the message over a PCM link connected to SS7 signaling terminals located within MSC and the BSC.
The TRC consists of subsystems that perform transcoding and rate adaptation which can be either stand alone or combined.

REGISTERS IN WIRELESS SYSTEMS:

VISITOR LOCATION REGISTER:

It is a database that temporarily stores information about any mobile station that attaches to a RBS in the area services by a particular MSC. This temporary subscriber information is required by the MSC to provide service to a visiting subscriber.

HOME LOCATION REGISTER:

It is a database that stores information about every user that has a cellular service contract with specific wireless service provider. This database stores permanent data about the networks subscribers, information about the subscribers present location. The HLR also plays a major role in the process of handling calls terminating at the MS. The HLR analyzes the information about the incoming call and controls the routing of the call.

AUC Interconnection:

The AUC provides authentication and encryption information for the MS being used in the cellular network. Upon a request from a VLR the HLR will be delivered a triplet for a particular mobile subscriber. The HLR receives the triplet information in response to a
request to the AUC for verification of a subscriber. The HLR forwards the random number and returns it to the MSC/VLR and from there to the HLR. The AUC contains a processor, a database for the storage of key information for each subscriber maintenance functions for subscriber and an interface for communication with HLR.

**EQUIPMENT IDENTITY REGISTER:**

Then EIR database is used to validate the status of mobile equipment. This global database is updated daily to reflect the current status of an MS. The MS can be blacklisted indicating that it has been reported stolen or missing and does not approve for network operation.

**INTERWORKING UNITS:**

IWUs are required to provide an interface to various data networks. These nodes are used to connect the base station controller and hence the radio base stations to various data services networks.

**GATEWAYS and its types**

1. **Gateway MSC:** (GMSC) gateway MSC is an MSC that interfaces the wireless mobile network to other telecommunication networks. A cellular network will have numerous MSCs to facilitate coverage of large area but all switching centers need to be connected to other wireline network. To support its function as gateway the GMSC will have ability to reroute a call to an MS using the information provided by the HLR of a subscriber.

2. **Billing gateway:** (BGW) this collects billing information from various wireless network elements which becomes a file use by customer administrative system to generate billing information for the system subscribers like monthly access fees, home usage, roaming, data and special services etc.

3. **Service order Gateway:** (SOG) It is used to connect a customer administrative system to the switching system. This system is used to input new subscriber data to the HLR or to update current subscriber data already contained in the HLR. The SOG allows access to the AUC and EIR for equipment administration. When a
customer signs a service contract with cellular service provider the information about the contract is entered into the customer administrative system.