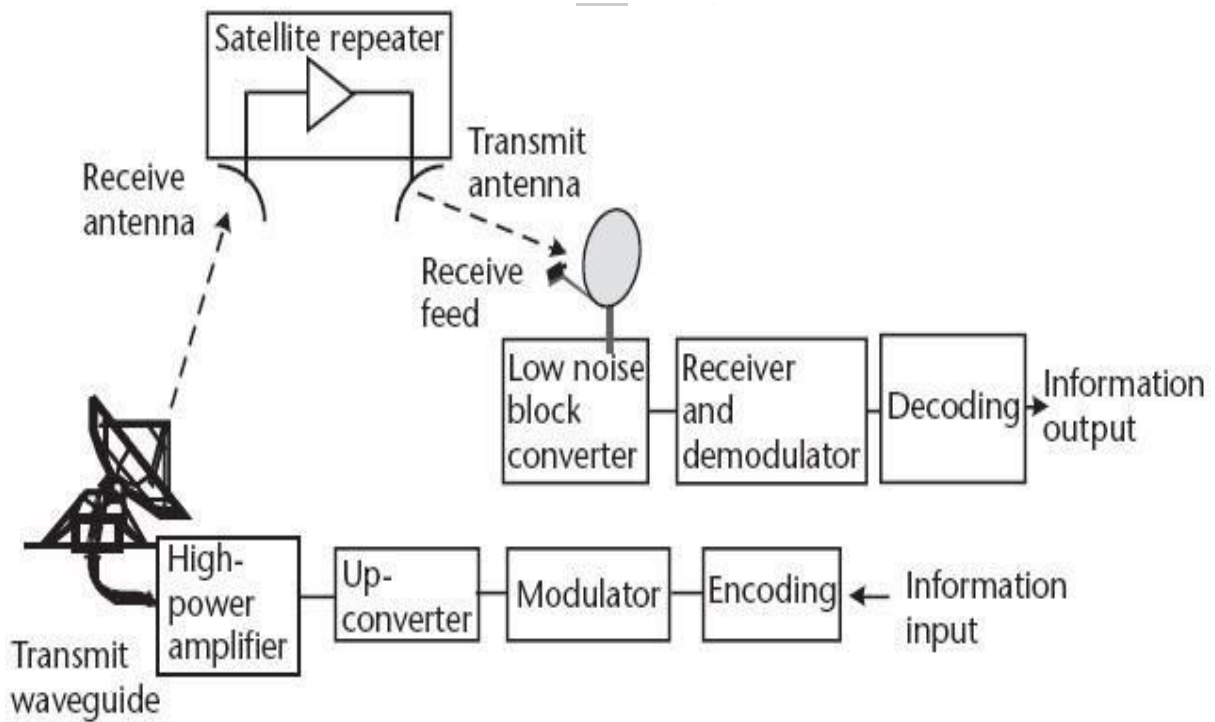


3.1 Basic link analysis

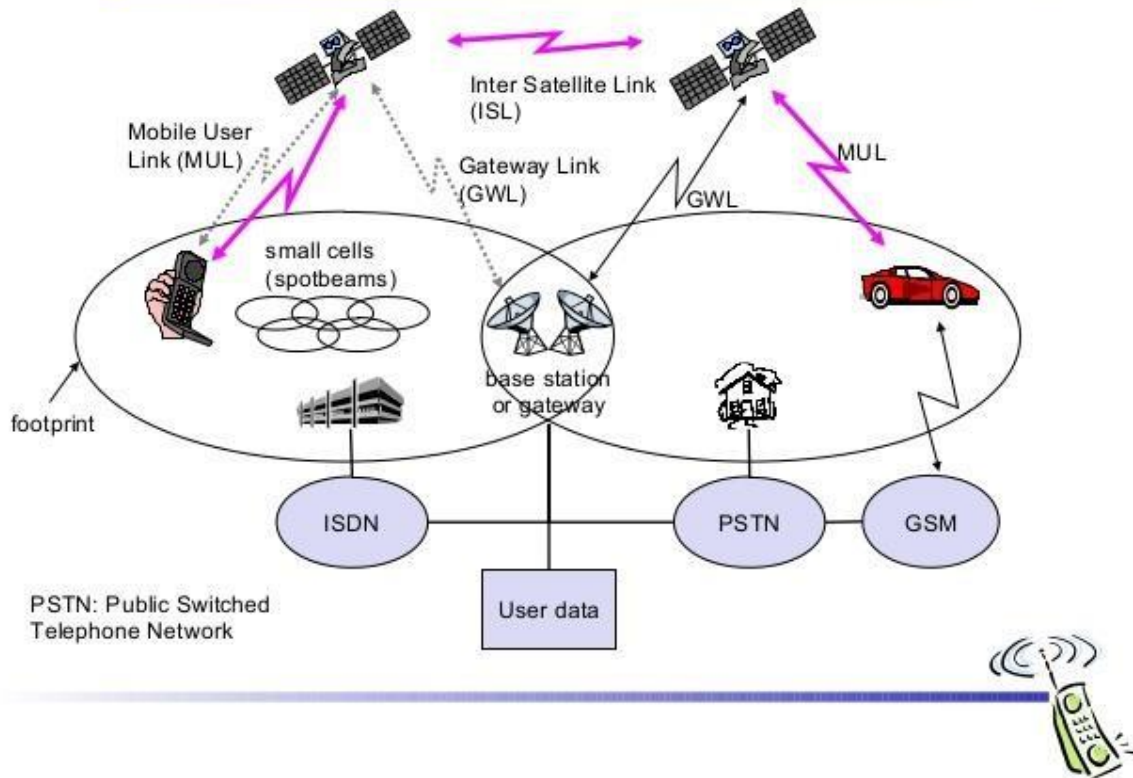
- Intra –orbital links :connect consecutive satellites on the same orbits
- Inter –orbital links :connect two satellites on the different orbits



Design of the Satellite System

OBSERVE OPTIMIZE OUTSPREAD

Classical satellite systems



LNB (LOW NOISE BLOCK DOWN CONVERTER)

- A device mounted in the dish, designed to amplify the satellite signals and convert them from a high frequency to a lower frequency. LNB can be controlled to receive signals with different polarization. The television signals can then be carried by a double-shielded aerial cable to the satellite receiver while retaining their high quality. A universal LNB is the present standard version, which can handle the entire frequency range from 10.7 to 12.75 GHz and receive signals with both vertical and horizontal polarization.

Demodulator

A satellite receiver circuit which extracts or "demodulates" the "wanted" signals from the received carrier.

Decoder

- A box which, normally together with a viewing card, makes it possible to view encrypted transmissions. If the transmissions are digital, the decoder is usually integrated in the receiver.
- recorded video information to be played back using a television receiver tuned to VHF channel 3 or 4.

- **Modulation**

The process of manipulating the frequency or amplitude of a carrier in relation to an incoming video, voice or data signal.

- **Modulator**

A device which modulates a carrier.

Modulators are found as components in broadcasting transmitters and in satellite transponders. Modulators are also used by CATV companies to place a baseband video television signal onto a desired VHF or UHF

Atmospheric Layers

A signal traveling between an earth station and a satellite must pass through the earth's atmosphere, including the ionosphere, as shown

Atmospheric Losses

- Losses occur in the earth's atmosphere as a result of energy absorption by the atmospheric gases.
- The weather-related losses are referred to as *atmospheric attenuation* and the absorption losses by gases are known as *absorption*. **Atmospheric scintillation:**
- This is a fading phenomenon, the fading period being several tens of seconds.
- It is caused by differences in the atmospheric refractive index, which in turn results in focusing and defocusing of the radio waves, which follow different ray paths through the atmosphere.

- Fade margin in the link power-budget calculations are used for Atmospheric Scintillation.

