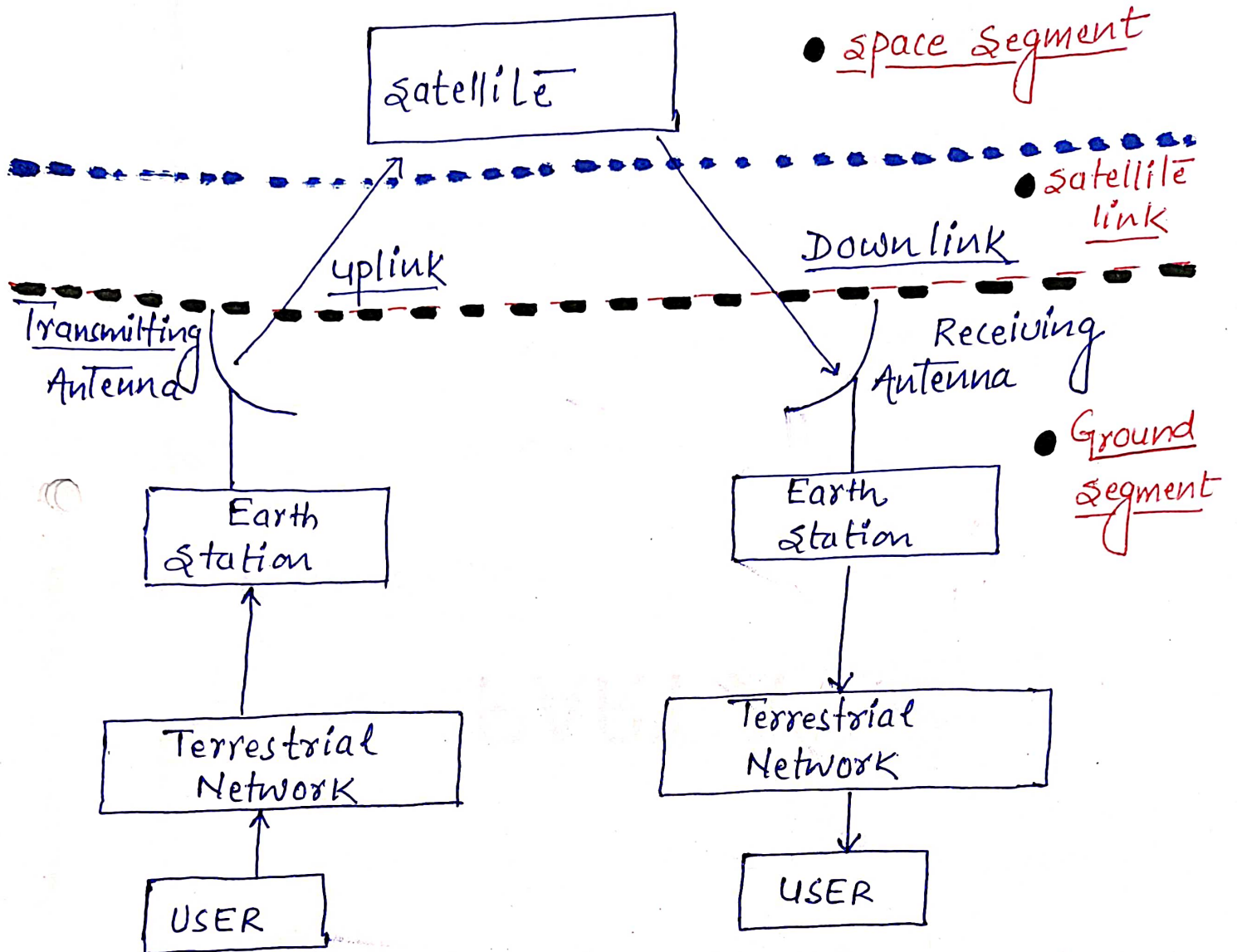


# Block diagram of Satellite Communication system

(1)



→ The block diagram of Satellite Communication is divided into 3 parts:-

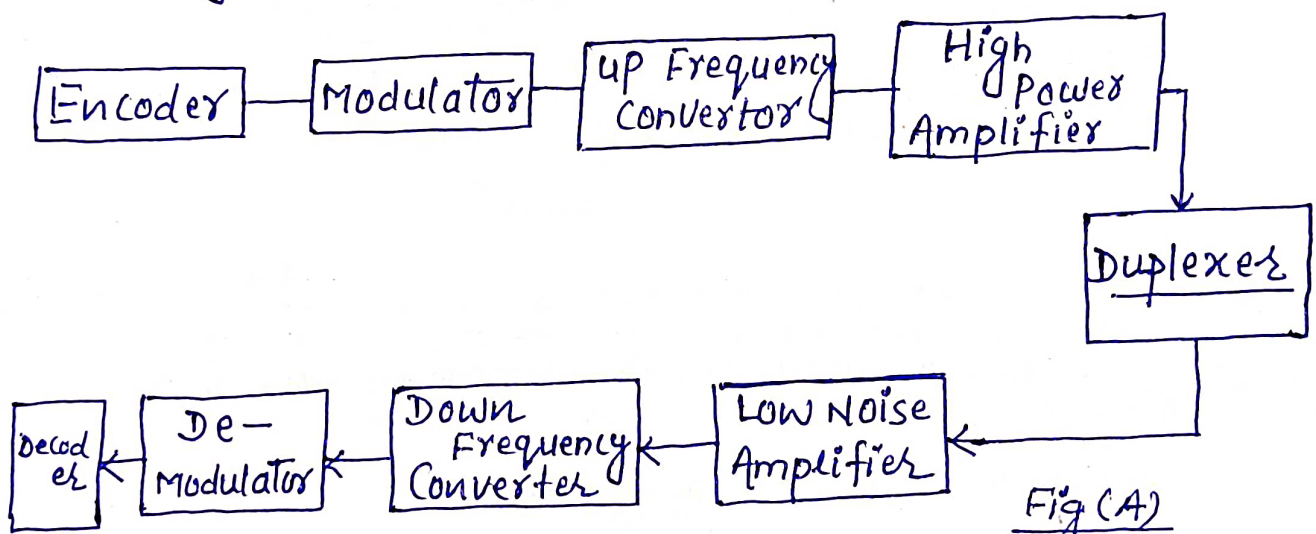
- (a) space segment
- (b) satellite link
- (c) Ground segment

\* Ground segment :- The information by the user to be transmitted may be in the form of speech, audio, video text, data etc.

→ If user is near to the transmitting Earth station then we don't need to have terrestrial network but if user is far from the earth station then terrestrial network helps to transmit the user's information to the transmitting earth station.

→ The signal which is given to the transmitting Earth station is known as base band signal.

Block diagram of Earth station :-



→ The baseband signal is firstly encoded by the encoder then modulator modulates the encoded base band signal.

The o/p of the modulator is fed to the up-frequency Converter which is used to up convert the frequency of the modulated signal required for transmission.



- Once the frequency is ~~fre~~ increased to the desired value, its power is amplified by the high power amplifier and then fed to the Duplexer.
- The property of the Duplexer is that the same antenna is used for transmitting as well as receiving the signal.
- ~~\*~~ Satellite Link :- Now the transmitting Earth Station's antenna transmits the information to the satellite via a satellite link, known as uplink.
- \* space segment :- Satellite receives the information through uplink from transmitting Earth Station and transmits the same information via downlink to the Receiving Earth Station.
- ⇒ Once the information is received, it is fed to the low noise amplifier as shown in Fig(A). Low noise amplifier suppresses the noise, then it is given to the down frequency converter which is used to down convert the uplink frequency to a value it was having at the time of modulation.

Then demodulator demodulates the modulated signal, which is given to the decoder to decode the baseband signal in its original form.

→ Then terrestrial network, at the ground segment, helps to transmit the information to the user at the receiving end.

### Advantages of Satellite Communication

- ① Can reach over large geographical area.
- ② Broadcast possibilities
- ③ provision of service to remote or underdeveloped areas.
- ④ Circuit cost independent of distance.

Disadvantages :- ① Congestion of frequencies & orbits  
② Interference and propagation delay.

Applications :- ① Global Telecommunication: Land, Sea, air  
② Broadcasting: Sound, T.V., multimedia etc.  
③ Military Communications  
④ Remote Sensing: Earth observation

## Need of Satellite Communication :-

①

→ Earlier two types of propagation were used :-

- (a) Ground wave propagation
- (b) Sky wave propagation

The maximum distance covered by them is limited to 1500 kms. Satellite communication overcomes this limitation. It provides communication for long distances even which is beyond the line of sight.

② More earth coverage with higher altitude of repeaters can reduce no of repeaters.

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