

TRANSMITTER AND RECEIVER

The functional elements of a basic digital earth station are shown in the below figure

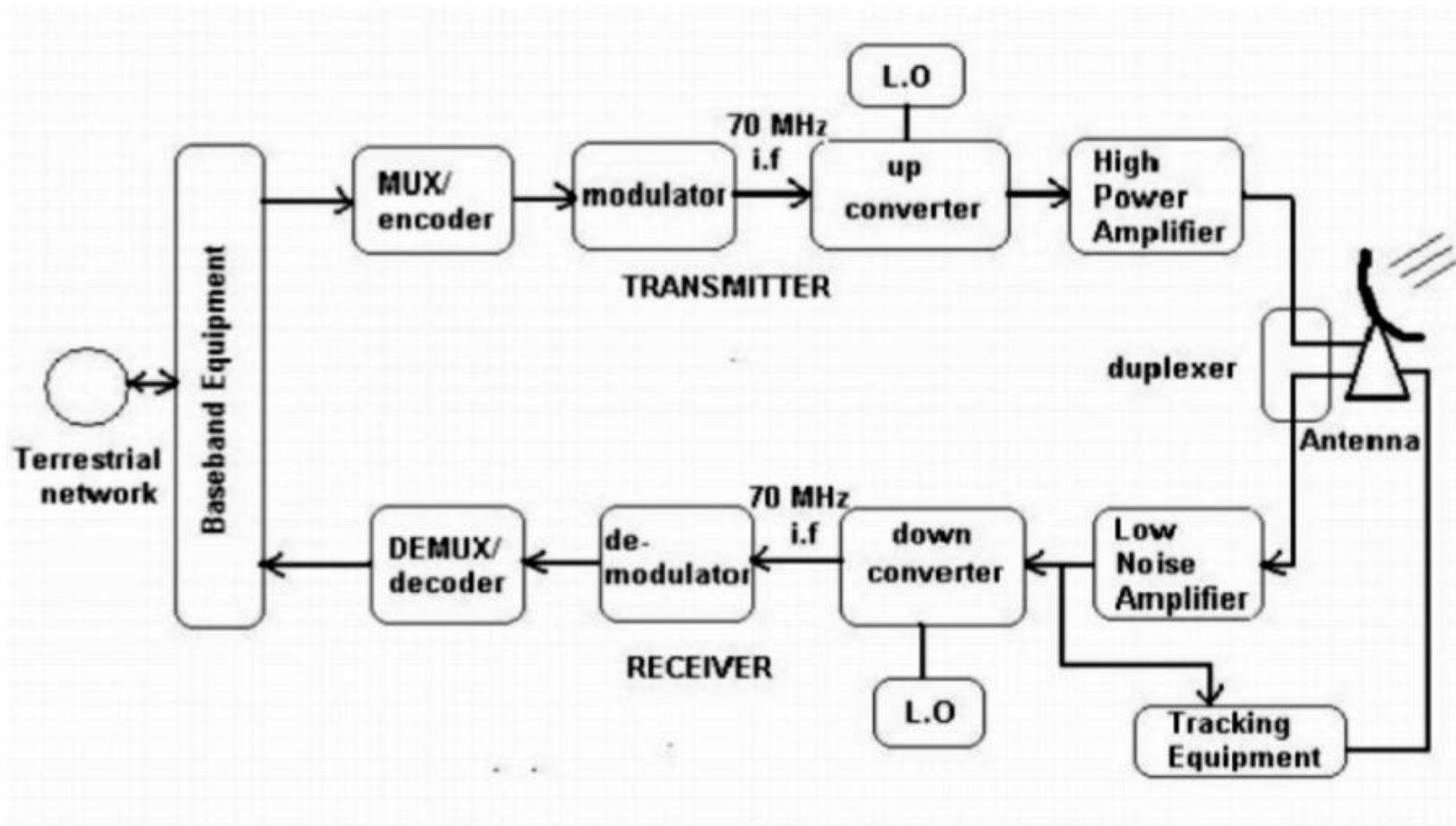


Figure 4.1 Transmitter- Receiver

The earth station consists a dish antenna transmitter that has high directivity and gain to overcome the losses over long transmission path.

Earth station establishes the communication between the users through satellite.

The main subsystems of earth station include:

1. Transmitter
2. Receiver
3. Antenna and
4. Tracking equipment.

The location where the earth station has to be placed, can be decided based on the function and control of satellite.

The TVRO [Television Receiver Only] or DBS [Direct Broadcast Satellite] Receivers, which are special earth stations do not have transmitting function.

Operation: Initially, the baseband signal from the end user is applied to encoder which converts into a format suitable for modulation. The signal is then made to pass through the modulator, where the carrier is modulated by encoded baseband signal. Then, the resulted modulated carrier is upconverted to uplink frequency of satellite.

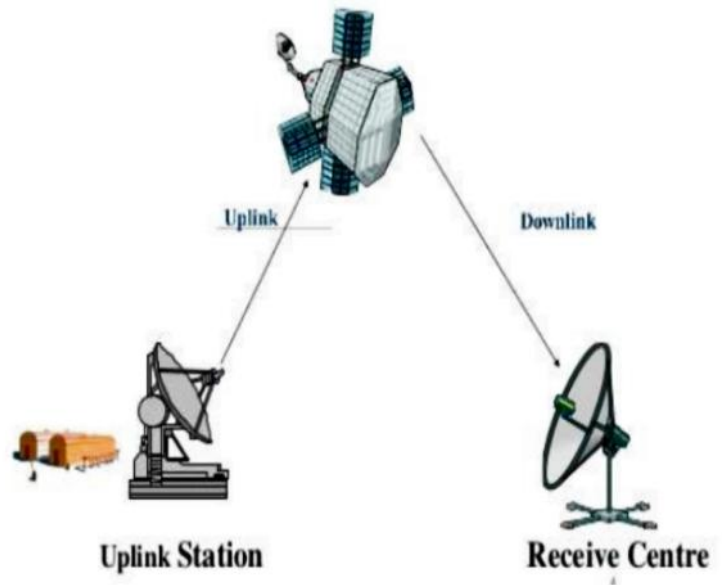
Finally, the upconverted signal is amplified to high power level by means of high power amplifier and then it is transmitted by the antenna. The receiver of earth station does the reverse operation to what the transmitter has done while transmitting the signal.

The small and large earth stations are using solid state power amplifiers and TWT amplifier klystrons respectively as high power amplifiers.

EARTH STATION SUBSYSTEMS

Any earth station consists of four major subsystems

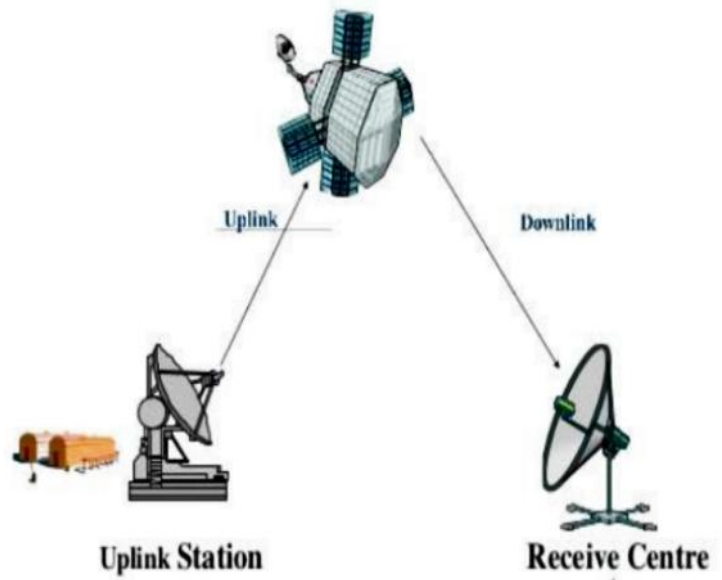
- ❑ Transmitter
- ❑ Receiver
- ❑ Antenna
- ❑ Tracking Equipment



EARTH STATION SUBSYSTEMS

Two other important subsystems are

- ❑ Terrestrial interface equipment
- ❑ Power supply



ANTENNA SYSTEMS :

The antenna system consist of

- ❑ Feed System
- ❑ Antenna Reflector
- ❑ Mount
- ❑ Antenna tracking System