

TRANSMITTER AND RECEIVER

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

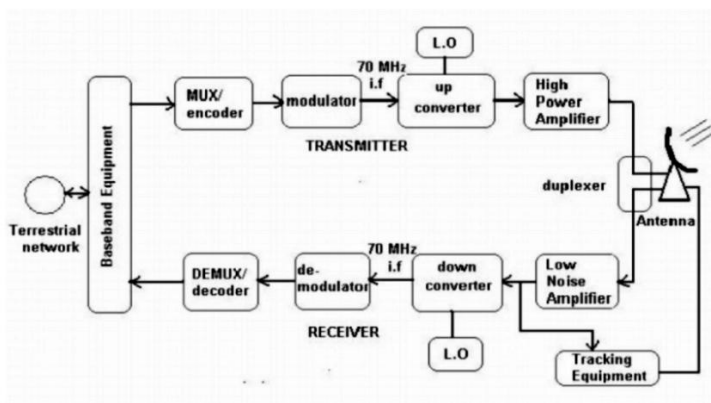


Figure 4.1 Transmitter- Receiver

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- ❑ Digital information in the form of binary digits from **terrestrial networks** enters earth station and is then processed (filtered, multiplexed, formatted etc.) by the base band equipment.
- ❑ The **encoder** performs error correction coding to reduce the error rate, by introducing extra digits into digital stream generated by the base band equipment. The extra digits carry information.
- ❑ In satellite communication, I.F carrier frequency is chosen at 70MHz for communication using a 36 MHz transponder bandwidth and at 140 MHz for a transponder bandwidth of 54 or 72 MHz.
- ❑ On the receive side, the earth station antenna receives the low-level modulated R.F carrier in the downlink frequency spectrum.

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- ❑ The **low noise amplifier (LNA)** is used to amplify the weak received signals and improve the signal to Noise ratio (SNR). The error rate requirements can be met more easily.
- ❑ R.F is to be reconverted to I.F at 70 or 140 MHz because it is easier design a demodulation to work at these frequencies than 4 or 12 GHz.
- ❑ The **demodulator** estimate which of the possible symbols was transmitted based on observation of the received if carrier.
- ❑ The **decoder** performs a function opposite that of the encoder. Because the sequence of symbols recovered by the demodulator may contain errors, the decoder must use the uniqueness of the redundant digits introduced by the encoder to correct the errors and recover information-bearing digits.
- ❑ The information stream is fed to the base-band equipment for processing for delivery to the terrestrial network.