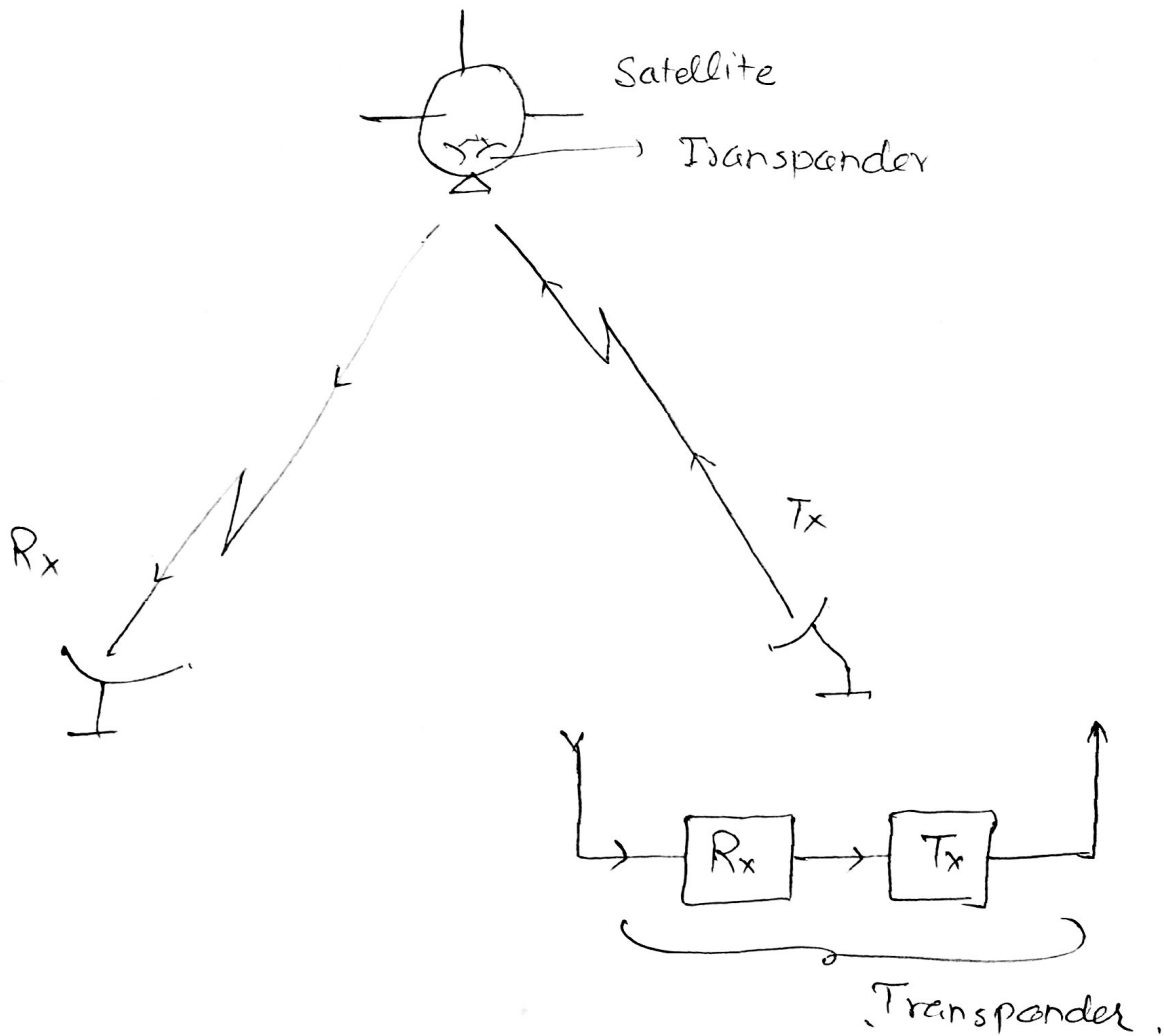


→ Transponders: - Combination of one receiver and one transmitter is called transponder.

The signals (called carriers) transmitted by an earth station are received at the satellite by zone beam antenna or spot beam antenna. The zone beam antenna can receive signals from anywhere within the coverage zone, while spot beam antenna have limited coverage. The received signal is often taken to low noise amplifier's.

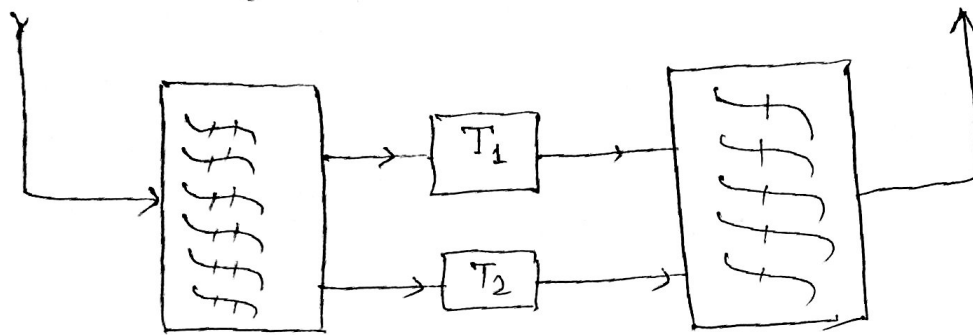
TWTA = Travelling wave tube amplifier  
(wideband amplifier)



In the early satellites such as INTELSAT-I & II <sup>used</sup> one or two 250 MHz transponders were used.

Later satellite used two transponders. 500 MHz bandwidth

\* divided into two channels  $250\text{ MHz}$  &  $250\text{ MHz}$  as shown in the following block diagram -



Separation  
in the form of  
Band-Pass  
filter.

Intelsat divide  $500\text{ MHz}$  by  $\longrightarrow$  12 transponders each  
channel  $36\text{ MHz}$   
wide

so entire bandwidth

$$500 = 36 \times 12 + \text{Guard band}$$

$$36 + 4 = 40$$

$$= 40\text{ MHz}$$

The carriers are separated  
by  $40\text{ MHz}$ .

24 transponders can be accommodated in the same  $500\text{ MHz}$  bandwidth. Linear Traditional linear transponder-type-satellites now have sixfold reuse or even sevenfold reuse. The reuse is achieved through microwave switch interconnections.

The transponder arrangement of RCA's satellite SATCOM is shown in the block diagram. The translation frequency is  $2225\text{ MHz}$ .