

BASICS OF COMMUNICATIONS SATELLITES

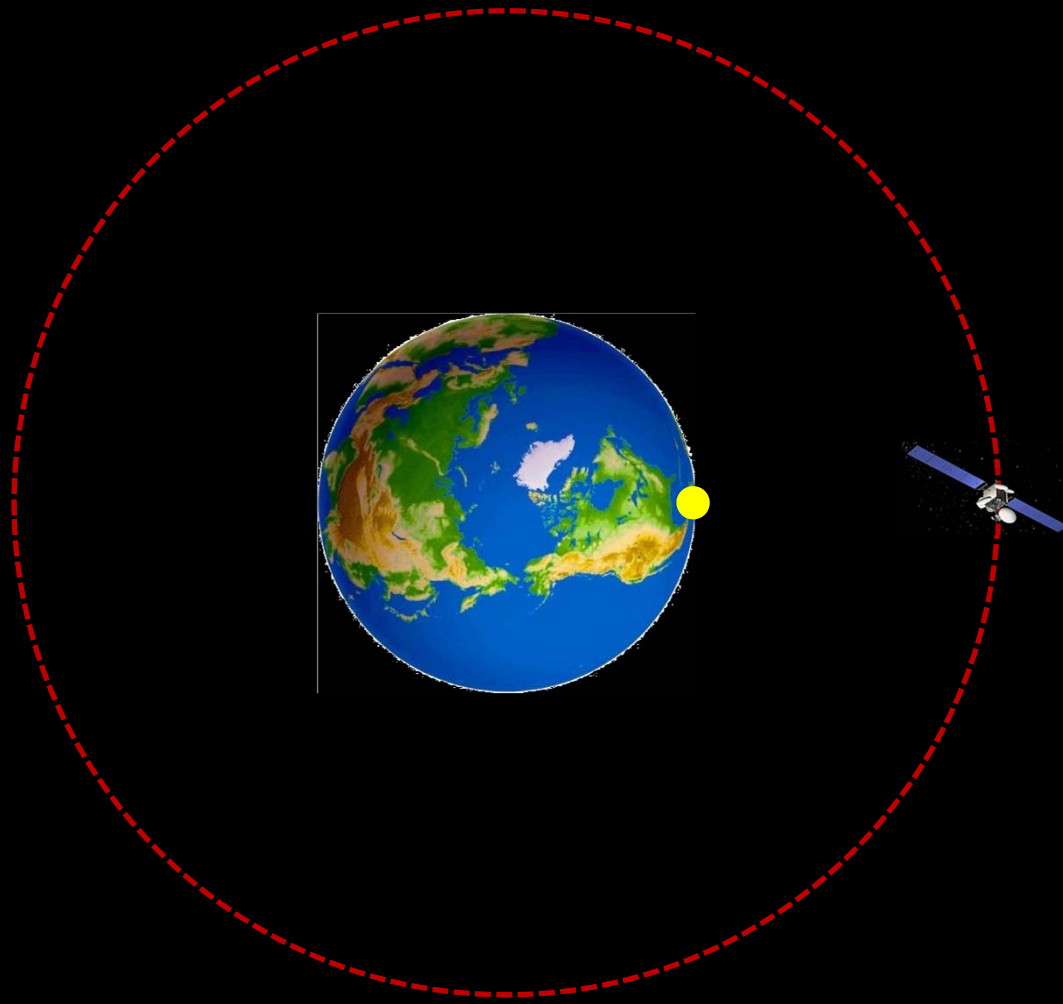
Presented By Bruce Elbert, BEE, MSEE, MBA
President, Application Technology Strategy, LLC

Geostationary Satellites

- Preferred orbit for a most applications is a **circular geostationary orbit**
- Tracks the rotation of the Earth and appears to remain stationary at its assigned longitude position above the equator
- Allows **fixed home dishes (also mobile)**



Geostationary Satellites



Early Analog Communication Satellites

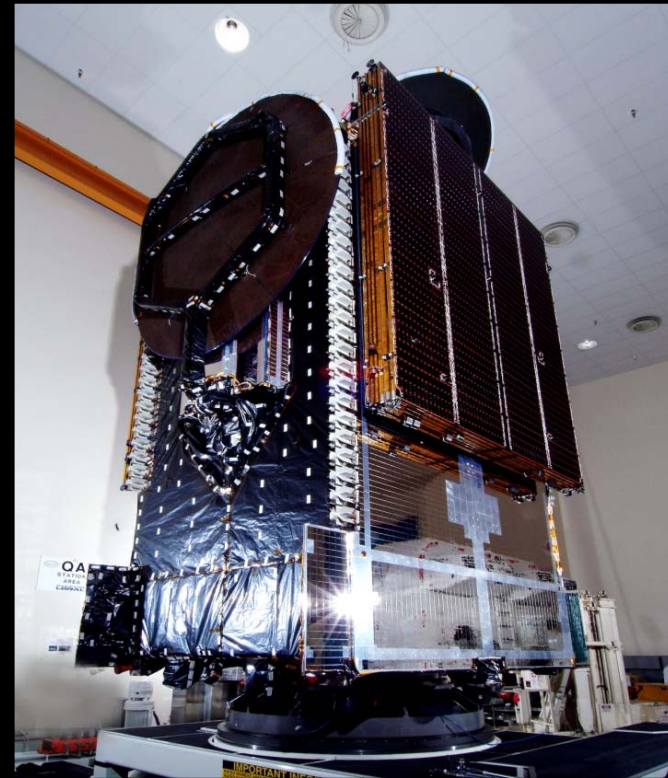


- First commercial geostationary satellite was “Early Bird” and began service in 1965
- Provided intercontinental telephone and television transmission
- Transmitted analog video signals similar to the signals transmitted by early ground-based television transmitters

Modern Communications Spacecraft



TerreStar-1
18-meter antenna reflector
(courtesy Space Systems/Loral)



EchoStar XI
Expands delivery of HDTV
(courtesy Space Systems/Loral)

Smaller Spacecraft

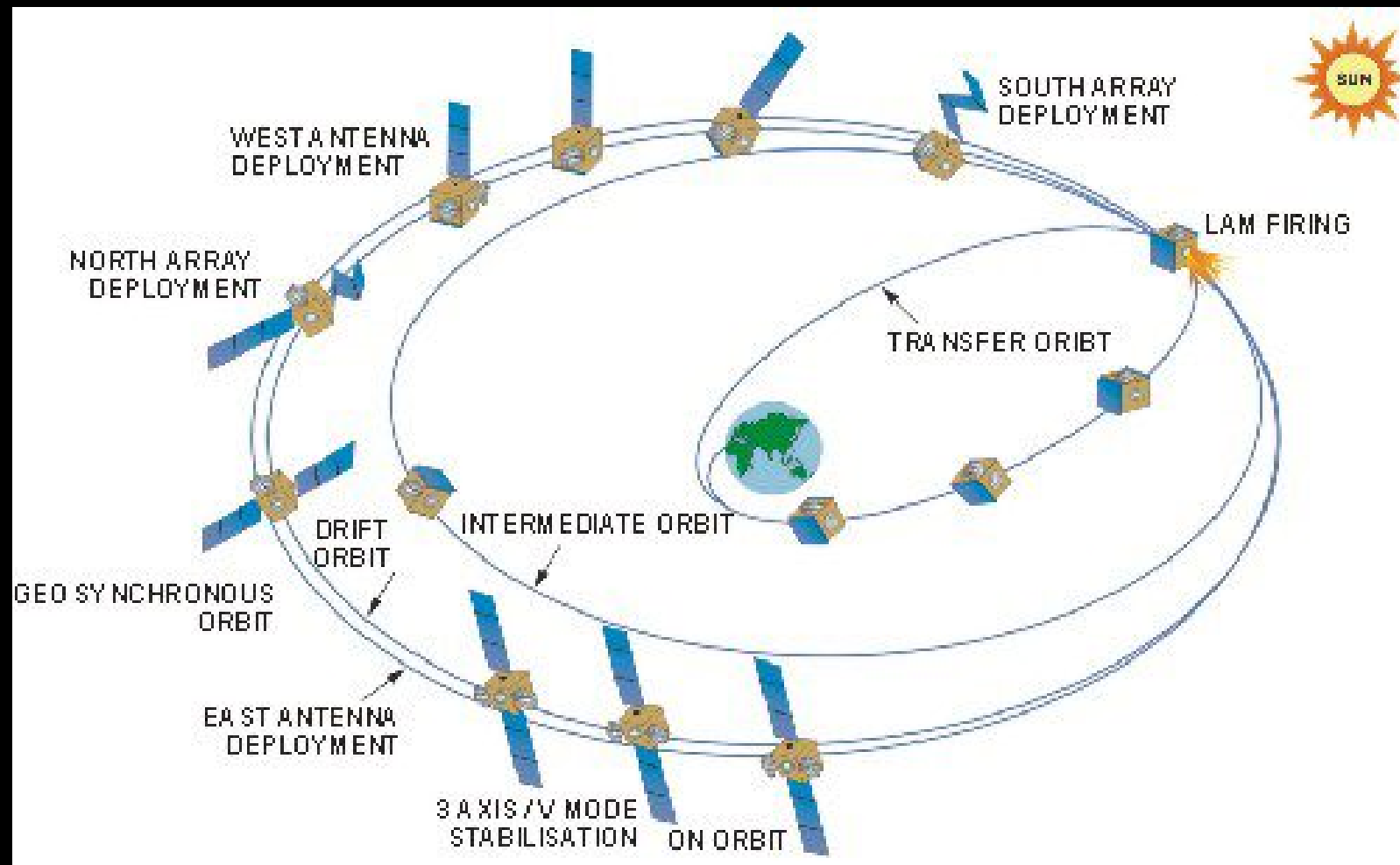


Orbital Sciences (Intelsat 11)

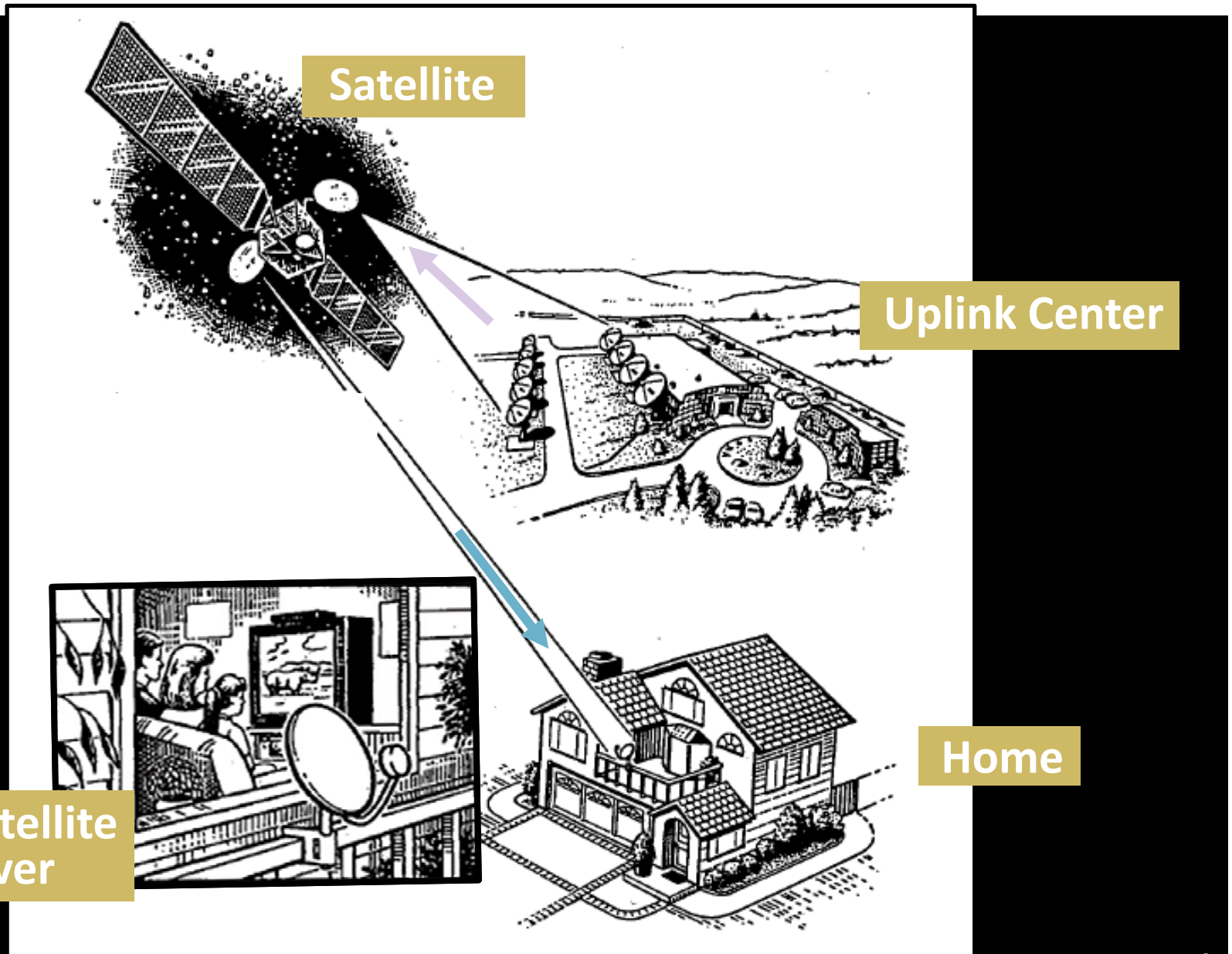


Boeing 702MP (Intelsat 21)

How a Satellite Reaches Orbit

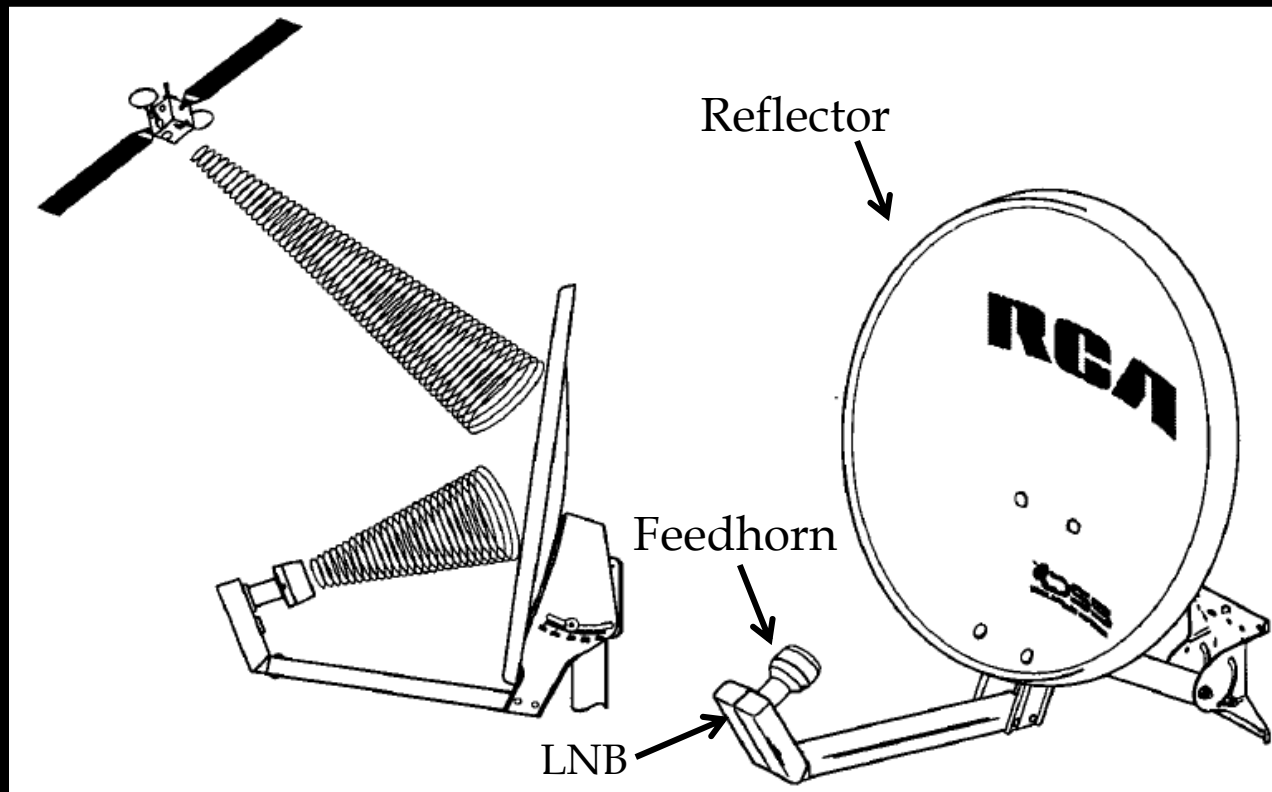


Home Satellite TV



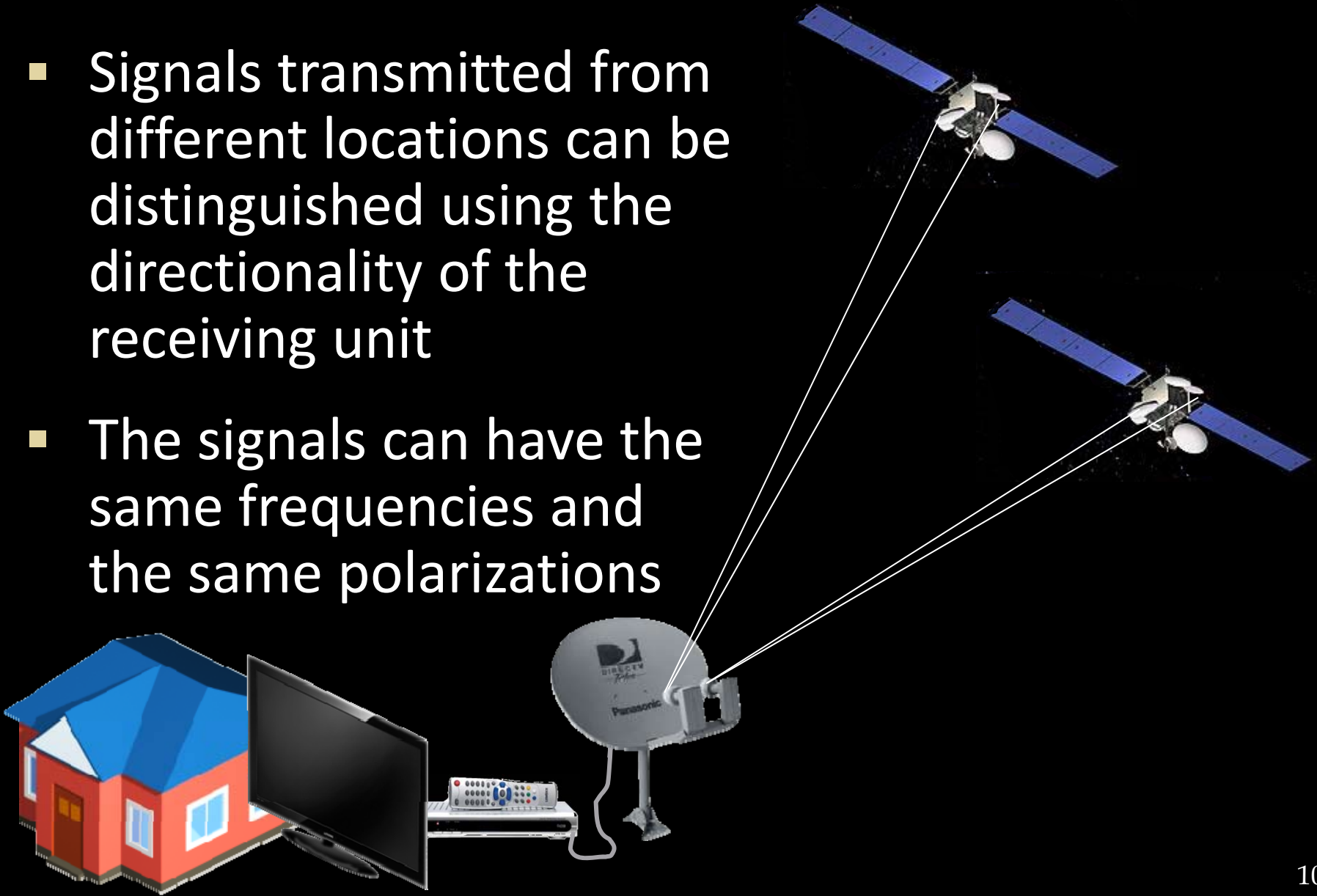
The Outdoor Unit (ODU): Components

- The ODU (outdoor unit) included a dish-shaped reflector, a feedhorn, and a low-noise block converter (LNB) circuit

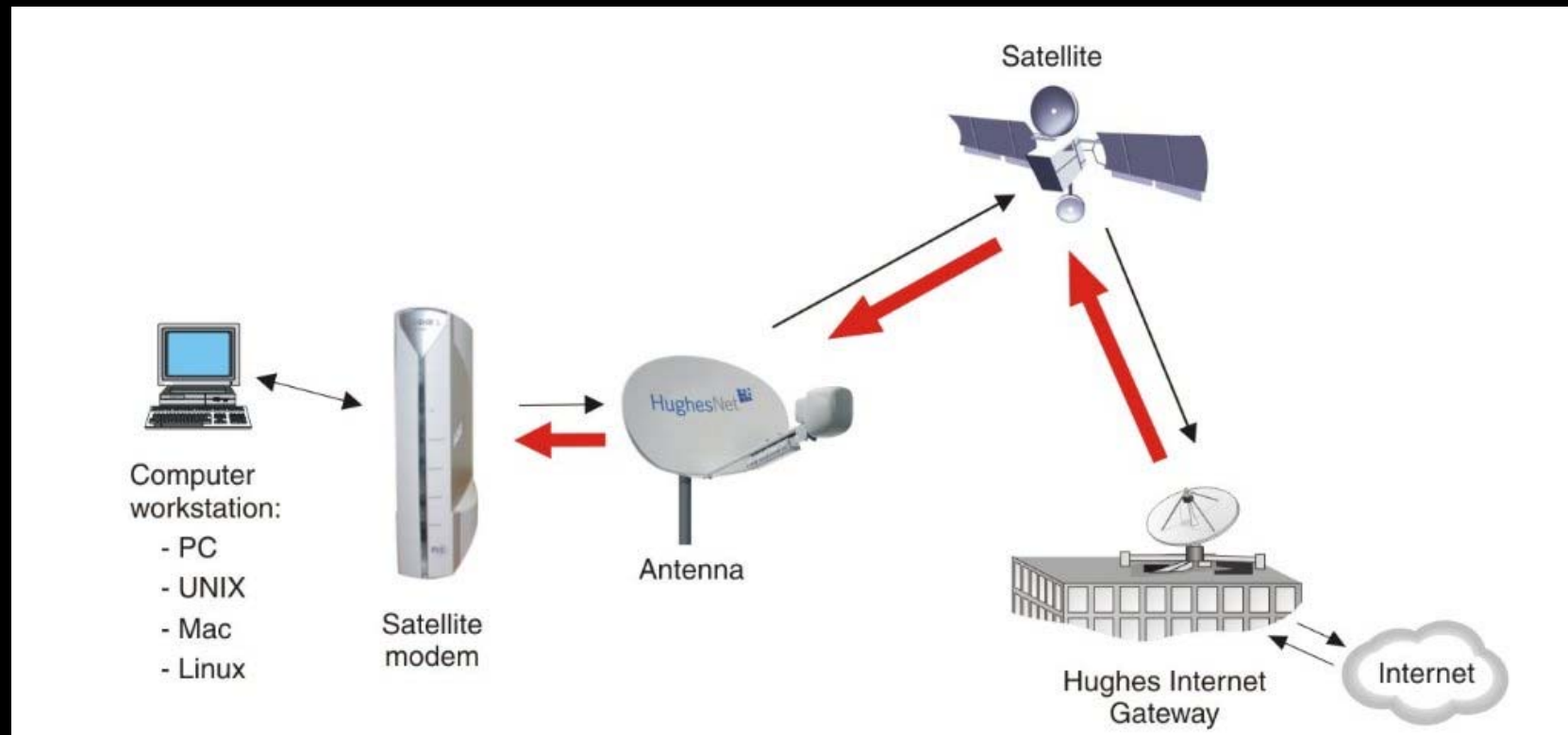


Avoiding Interference: Different Locations

- Signals transmitted from different locations can be distinguished using the directionality of the receiving unit
- The signals can have the same frequencies and the same polarizations



Interactive Broadband – Two-way



Where are the Jobs?

- Engineering
- Science
- Operations
- Legal and regulatory
- Marketing and sales
- Service, programming
- Business and finance
- Management