

EEE567 - SATELLITE COMMUNICATION
LABORATORY SESSION: SATELLITE TRACKING
Friday, September 12, 2025

1.0 Objective

To make the learners understand:

- i) the trajectories of satellites in space
- ii) Space parameters of GEO, LEO Satellites
- iii) Space parameters of Military, Weather and Communication Satellites
- iv) Understand the importance of satellite international codes and their composition.
- v) various computations of the satellite tracking software and link them to theory.

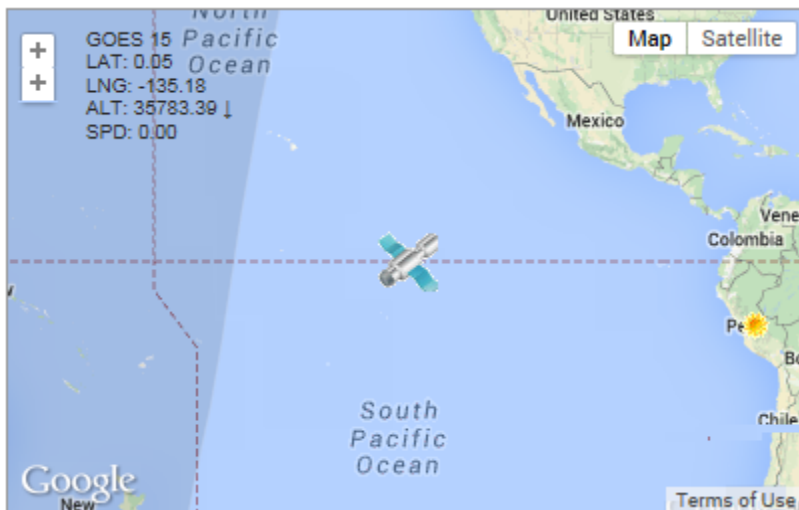


Figure 1 Satellite Tracking (image)

2.0 Laboratory Equipment Required

Computer workstation running Windows 7 or later version with connection to the Internet.

3.0 Methodology

1. Open website: <http://www.n2yo.com>
2. Track the satellites shown below.
3. Repeat for each satellite by using the <https://orbtrack.org>

SATELLITE PARAMETERS

Enter the parameters and fill the table below.

Satellite	Parameters
ESIAFI 1 (COMSTAR 4)	1. Type 2. International Code..... 3. Launch Date 4. Perigee 5. Apogee 6. Period 7. Speed 8. Azimuth..... 9. Elevation 10. Projected End of Life
GSAT-14	1. Type 2. International Code..... 3. Launch Date 4. Perigee 5. Apogee 6. Period 7. Speed 8. Azimuth..... 9. Elevation 10. Projected End of Life
NAVSTAR 65 (USA 213)	1. Type 2. International Code..... 3. Launch Date 4. Perigee 5. Apogee 6. Period 7. Speed 8. Azimuth..... 9. Elevation 10. Projected End of Life

Satellite	Parameters
STARLINK-4765	1. Type 2. International Code..... 3. Launch Date 4. Perigee 5. Apogee 6. Period 7. Speed 8. Azimuth..... 9. Elevation 10. Projected End of Life
IRIDIUM 96	1. Type 2. International Code..... 3. Launch Date 4. Perigee 5. Apogee 6. Period 7. Speed 8. Azimuth..... 9. Elevation 10. Projected End of Life
INTELSAT 35E	1. Type 2. International Code..... 3. Launch Date 4. Perigee 5. Apogee 6. Period 7. Speed 8. Azimuth..... 9. Elevation 10. Projected End of Life

Satellite	Parameters
TAIFA-1	1. Type 2. International Code..... 3. Launch Date 4. Perigee 5. Apogee 6. Period 7. Speed 8. Azimuth..... 9. Elevation 10. Projected End of Life

QUESTIONS

- What do the following terms mean and who assigns them (Use google)?
 - NORAD ID
 - International Satellite Code
- (a)** Derive value of the velocity of a satellite (V_s) and use the equation to compute the speed of the following satellites:
 - GOES 15
 - Iridium 96

Assume $G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$ and $M = 5.98 \times 10^{34} \text{ Kg}$.

- How does your computation compare with the value displayed by the satellite tracking program?
- Computation of various azimuth and elevation is dependent on the geographic location (latitude and longitude). Explain how the software takes this into account.
 - How many Iridium satellites are parked. Why is satellite parking necessary?
 - Locate and list FOUR parked geostationary satellites. Why is it necessary to park geostationary satellites?
 - Draw and compare the footprints of the following satellites on the world map.
 - TAIFA-1
 - IRIDIUM 96
 - ESIAFI 1