The Report On

INDUSTRIAL TRAINING PROGRAMME

ISTC- Institute of Satellite Telecom Pvt.Ltd. Kharadi, Pune

BACHELOR OF ENGINEERING

Department of Electronics and Telecommunication Engineering

RAJENDRA MANE COLLEGE OF ENGINEERING &TECHNOLOGY AMBAV (DEVRUKH)

University of Mumbai

YEAR 2017-18

Industrial Training Programme was organised to ISTC Pvt. Ltd, Pune on 9th April 2018 by Department of Electronics and Telecommunication Engineering of Rajendra Mane College of Engineering and Technology,Ambav. Prof. S.P.Adure has taken the valuable efforts to organise this industrial Training Programme for the students of BE EXTC. Prof. S.P.Adure and Prof. I.A.Shikalgar Co-ordinated this 1 day training programme at ISTC centre. 40 students from BE EXTC are participated in this programme.

About venue – ISTC Pvt. Ltd.Kharadi,Pune

ISTC Pvt. Ltd. is founded and established in 2000 by Mr. Krish K. Mehkarkar. Under his direction, ISTC has a versatile and experienced team of technical specialists providing system integration expertise in the development and implementation of satellite earth station and terrestrial head ends.

- **Training Schedule:-**

Date-09/04/2018

- 10:00am-10:30am-Registration
- 10:30am -1:00pm- Lecture by Mr. Krish K. Mehkarkar
- 1:00pm-2:00pm:- Lunch
- 2:00pm-5:00pm:- Practical Session

1] **Session-1**

- Mr. Krish K. Mehkarkargiven introduction about the ISTC centre.

Important topics covered in lecture

- Overview of satellite communication

ORBIT NAME	ORBIT INITIALS	ORBIT ALTITUDE (KM ABOVE EARTH'S SURFACE)
Low Earth Orbit	LEO	200 - 1200
Medium Earth Orbit	MEO	1200 - 35790
Geosynchronous Orbit	GSO	35790
Geostationary Orbit	GEO	35790

- Satellite orbits

- Frequency bands and their application

There are four radio frequency bands that communication and military satellites operate within:

- **C band – uplink 5.925-6.425 GHz; downlink 3.7-4.2 GHz**
  The C band is primarily used for voice and data communications as well as backhauling. Because of its weaker power it requires a larger antenna, usually above 1.8m (6ft). However, due to the lower frequency range, it performs better under adverse weather conditions on the ground.
- **X band – uplink 7.9- 8.4 GHz, downlink 7.25 – 7.75 GHz**
  The X band is used mainly for military communications and Wideband Global SATCOM (WGS) systems. With relatively few satellites in orbit in this band, there is a wider separation between adjacent satellites, making it ideal for Comms-on-the Move (COTM) applications. This band is less susceptible to rain fade than the Ku Band due to the lower frequency range, resulting in a higher performance level under adverse weather conditions.
- **Ku band– uplink 14 GHz; downlink 10.9-12.75 GHz**
  Ku band is used typically for consumer direct-to-home access, distance learning applications, retail and enterprise connectivity. The antenna sizes, ranging from 0.9m - 1.2m (~3ft), are much smaller than C band because the higher frequency means that higher gain can be achieved with small antenna sizes than C-band. Networks in this band are more susceptible to rain fade, especially in tropical areas.
- **Ka band – uplink 26.5-40GHz; downlink 18-20 GHZ**
  The Ka band is primarily used for two-way consumer broadband and military networks. Ka band dishes can be much smaller and typically range from 60cm-1.2m (2' to 4') in diameter. Transmission power is much greater compared to the C, X or Ku band beams. Due to the higher frequencies of this band, it can be more vulnerable to signal quality problems caused by rain fade.

- International and Indian satellites revolving around the earth

  - Communications: 742 satellites
  - Earth observation: 596 satellites
  - Technology development/demonstration: 193 satellites
  - Navigation/Positioning: 108 satellites
  - Space science: 66 satellites
  - Earth science: 24 satellites
  - Space observation: 9 satellites

- Emerging technologies in satellite communication with Ka band frequencies.
- Opportunities for EXTCEngineer in Satellite Communication Field

2]**Session-2**

In this session students divided into Three batches for practical performance.

Important Topics Covered:-

1] Geostationary satellite position

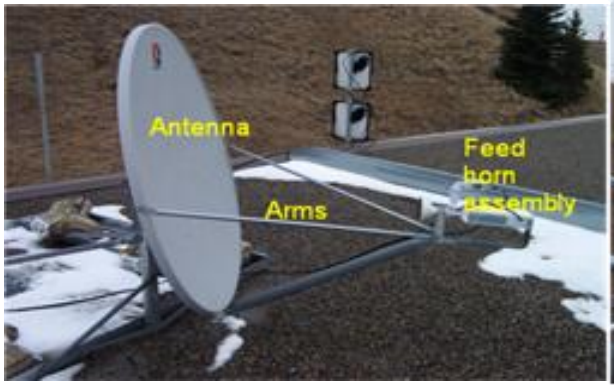
Receiving antennas are positioned toward South east South west region.

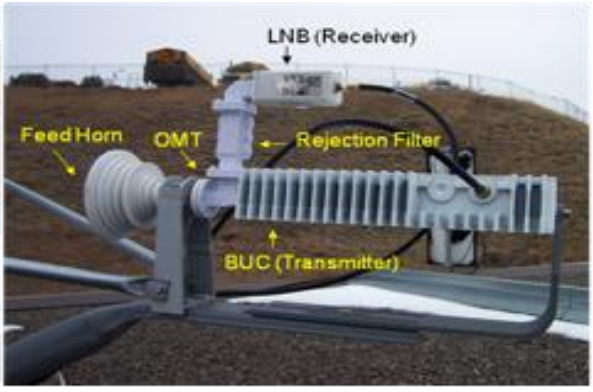
2] DTH-

- different DTH services and antenna position
- types of LNB
- Dish antenna Setup
- Types of connectors
- Use of DB-meter

3] Introduction and Working of VSAT

VSAT (Very Small Aperture Terminal) satellite communications provide reliable Internet communications to accommodate both business data applications and voice communications at remote locations around the globe. As with any complex project; proper planning, professional implementation and on-going support of your VSAT communications are critical success factors.





4] **Cassegrain antenna:-**

Cassegrain antenna is a parabolic antenna in which the feed antenna is mounted at or behind the surface of the concave main parabolic reflector dish and is aimed at a smaller convex secondary reflector suspended in front of the primary reflector. The beam of radio waves from the feed illuminates the secondary reflector, which reflects it back to the main reflector dish, which reflects it forward again to form the desired beam. The Cassegrain design is widely used in parabolic antennas, particularly in large antennas such as those in satellite ground stations, radio telescopes, and communication satellites.

5]Signal tracking and calculation of signal to noise ratio using Spectrum analyser

- Azimuth and Elevation angle
- Polarization

PHOTO GALLERY:-

1] Session-1 [Theory]

2] Session-2 [practical]

DTH- Installation:- Cable connection using preparator

Various DTH service providers information

Observing received signal on Spectrum analyzer

Various Components in DTH installation-LNB,Waveguide

Indoor Unit of VSAT

Tracking of double reflector antenna to receive maximum signal strength from satellite

Group photo with MD of ISTC Mr. Krish K. Mehkarkar