TCET 3222

Week: 2

Lab #:   1

Lab Title: SMW-Link (Software has already been installed on computers)

a.   Software Description:

This software does all the necessary calculations about how to align the antenna and what picture quality is obtained.

b.   Objective:

The objective of this lab is to study the effects of factors that influence the performance of a satellite communication link. Such factors include:
   a. e.i.r.p.
   b. Attenuation mainly due to rain at different rates.
   c. Antenna size and noise temperature.
   d. Bandwidth.
   e. Elevation Angle
   f. Efficiency

By varying each one of the above parameters, one can observe graphically the quality of the received signal.

c.   Procedure

   In each of the following cases, after each part, reset the values to the default values.

   I.   Click on C/N. Change the rain rate to 5, 10, 30 & 50 mm/hr.

      a. In each case, observe the effect of rain attenuation on Carrier/Noise. Plot your

      results and explain.

      b. Plot C/N vs. Rain rate and explain the behavior of your observation.

   II.   Change e.i.r.p. to 40, 43, 46 & 50 dbw. In each case plot C/N vs. e.i.r.p and explain the

   behavior you observe.

   III.   Change the antenna diameter from 20 cm to 50 cm in steps of 10. Plot C/N vs. antenna

   size and explain the behavior of your observations.

   IV.   Change the efficiency from 10% to 50% in steps of 10. Plot C/N vs. efficiency and

explain the behavior of your observations.

V. Change the antenna noise from 0 degree to 35 degrees in steps of 10. Plot C/N vs. antenna noise and explain the behavior of your observations.

VI. Change the Noise Figure from 0.1 dB to 1.0 dB in steps of 0.2 dB. Plot C/N vs. noise figure and explain the behavior of your observations.

VII. Change the bandwidth from 10 MHz to 60 MHz in steps of 10. Record the results and explain.

VIII. Change the Elevation Angle from 10 degrees to 70 degrees in steps of 10 for clear sky and 10 mm/hr rain rate. Record your results and explain.