EXPERIMENT 3

GROUP 6:

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INTRODUCTION:

We have couple of objectives on this experiment. These are :

- Be able to define the impedance of a waveguide.
- understand the meaning of the term “characteristic impedance”
- know a method of measuring impedance
- know how to use a Smith Chart.

We worked on how can we find VSWR before experiments. Now we are working on how we will use VSWR on Smith Chart. We already knew if VSWR is small, it means good. Unless it is not good because of reflecting signal.

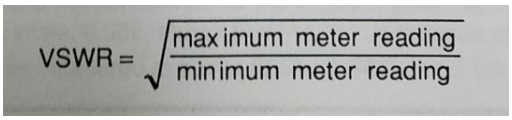
EXPERIMENTAL PROCEDURE:

We have some step on experiment. We will go our conclusion step by step.

1. Find the maximum&minimum reading:

Max1= 3,9 mA
Min1= 1,9 mA X1= 34 (mm)

2. Find the VSWR value:



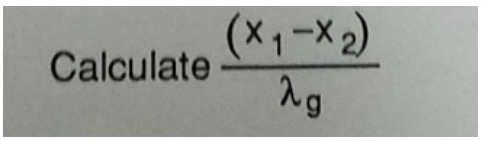
VSWR= 1,4327 (for our whole system’s value)
** Now we found our circle on the Smith Chart. **

We found our system VSWR after that we changed our experiment kit’s load side with Short Circuit.

3. Replace load with Short and Measure new minimum values’ distance for λ :

Min2 at X2= 26 (mm) **λ**= (44-26)*2= 36 (mm)
Min3 at X3= 44 (mm)

4. Calculate “d” value:



d1= 0,22 (mm)

5. Move d much on Smith Chart and find "ZL" :

Smith Chart has two important point on itself. One of them is short-circuit point on the left side and open-circuit point on right side. At these points Smith Chart on every 0,5 value refresh itself. Because of that we are working on d values. While working on Smith Chart we have to be careful about sign of our d value. If it has (+) positive value, we have to go towards Load way. If it has (-)negative value, we have to go towards Generator way. After finding our value on Smith Chart, when we draw a line to origin to this point. It will give us to "ZL" value.

ZL= 1,5+ J0,2

If we use our X3 value for d:

d2= -0,28 (mm) * our value is negative so that we will go towards generator side and we will see same result on Smith Chart.

CONCLUSION:

We worked on a waveguide in which no reflections. It called "characteristic impedance". It means our VSWR value is so small. We observed the VSWR, the impedance and distance are related together by the Smith Chart. A method of measuring impedance is to measure the VSWR, then substitute a short-circuit for impedance in exper,iment, and measure the displacement of the minimum in the wave form.