



इ रि से ट
बाहरी दूरसंचार प्रयोगशाला
प्रयोग नं: एल पी - 5

IRISSET
OUTDOOR
TELECOM LABORATORY
EXPERIMENT NO.: LP - 5

नाम

Name : _____

अनुक्रमांक

Roll No : _____

पाठ्यक्रम

Course : _____

दिनांक

Date : _____

प्राप्त अंक

Marks Awarded : _____

अनुदेशक का अधाक्षर

Instructor Initial : _____

V. F. BALANCING ON UNDERGROUND CABLES IN ELECTIFIED AREAS

INTRODUCTION

V. F. Balancing is done to reduce cross talk/noise that may be introduced because of various unbalances in the cable.

The various unbalances are:- (capacitance unbalances)

- 1) Unbalances of the pairs with reference to earth.
- 2) “ of pairs of one quad to the pairs of the adjacent quad.
- 3) Unbalances within the quad.

These unbalances can be measured with the help of capacitance unbalance Measuring Set. (CUM set)

The unbalances are: - (as readable from the instrument)

E1 = Pair 1 to Earth }
E2 = Pair 2 to Earth } unbalances with reference to earth.

K1 = Pair 1 to pair II }
K2 = Pair I and phantom } within the quad.
K3 = Pair II and phantom }

K9 = Pair I of quad I To pair I of adjacent quad (2) }
K10 = Pair I of quad I to pair II of adjacent quad (2) } balances
K11 = Pair 2 of quad I to pair I of quad (2) } with adjacent
K12 = Pair 2 of quad I pair 2 of quad (2) } quad.

This experiment is to measure these unbalances in the piece of cable in the Lab. and to get familiarized with the operation of the C.U.M. Set.

PROCEDURE

I) Balancing of connecting leads:

In the field while measuring the unbalance, the connection between the cable and the equipment is made with the help of extension wires (leads). Any unbalances in these leads will add up with the unbalances of the cable and may give wrong readings. So, the leads should be balanced first. For this keep the leads free.

Put the switch $\left. \begin{array}{l} k1, k2, k3, \\ E1, e2, e3, \end{array} \right\}$ in E1. 3 position

And adjust the variable condenser corresponding to $e1$ and see that the minimum tone is heard or the meter reads minimum current. This variable condenser should be locked in this position. Similarly, Lead balancing should be done for $e2$, $e3$ and $K1$, $K2$ and $K3$ and these should be locked.

II) Measurement of earth coupling:

- 1) Connect one sheath of the cable to earth $p1$
- 2) Connect one quad of the cable to I (a-b) of the instrument
- 3) Keep the switch in $e1$ position and adjust the main condenser (with dial) till min, sound is heard on the headphone. The reading of the dial along the central line is the value of $e1$,
- 4) Similarly the value of $e2$ $e3$ and $k1$ $k2$ $k3$ can be taken.

Add extra condensers across I, III, or I, II at the other end of the cable to create artificial unbalance. In practice the other end of the cable will be kept isolated.

Measured value of $e1$, $e2$, & $K1$, $K2$, $K3$

Values	Values
- $e1$	$k1$ -
- $e2$	$k2$ -
	$k3$ -

Add extra condensers at the other end across the conductors of any two adjacent quads (i.e.) I of quad 3 and II of quad 3 and II of quad 3 and II of quad 4.

III) Measuring the value of $k9$, $k10$, $k11$, $k12$.

Connect the quad 3 of the cable to I (a-b) (c-d) of the equipment and quad 4 of the cable to II (ab) (c-d) of the equipment.

Keep the switch $k1$ $k2$ $k3$ in position $e1$, $e2$, $e3$,

Turn the switch (adjacent quad coupling) which has making of $k4$ to $k12$ to $k9$ position.

Adjust the main capacitor till min. sound is heard. The value of $k9$ to $k12$ can be obtained by changing the position of the switch.

Measure the value of

$K9 =$ $k10 =$ $k11 =$ $k12 =$

IV) VF balancing (adjacent quad balancing):

(1) To balance unbalances with adjacent quad.

Quad Nos	k9	K10	K11	K12
Measured Value				
Condenser to be added				
Across the wires				
Balance				
Remarks				

Observe the following:

(1) Keep the switch in k1, position and short circuit link II & III of quad 3.
(Switch connections duly made).

(2) Keep the switch in k1, position & short circuit pair I of quad 3.

Observations:

(1)

(2)

REVIEW QUESTIONS:

1. What is the length of a section while balancing?
2. What are the special precautions to be taken in making condenser joint?
3. What is half loading section? Where it will come?
4. What is done in case the full loading section is not there for VF balancing?
(Building out network)
5. Describe as to how the reading is obtained in case of measurement of k1?
6. What is the permissible limit of various unbalances allowed for a loading section?

Date:

Signature of Trainee