

TESTS AND ADJUSTMENTS

TOLL CONFERENCE GROUPING CIRCUIT

SIX-OUTLET ARRANGEMENT WITH REPEATERS

SWITCHING PAD, NON-GAIN AND CORD CIRCUIT REPEATER OFFICES

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2. REQUIREMENTS AND LIMITS

2.01 For switching pad and non-gain offices, the requirements and limits given in this Section are based on repeater gains of 6 db and switching pad losses of 4 db for non-volcas branches and repeater gains of 8.5 db and switching pad losses of 6.5 db for volcas equipped branches. In cord circuit repeater offices, the repeater gains are 9 db and the switching pad losses are 7 db for the non-volcas branches, and for the volcas branches, the gains are 11.5 db and the pad losses are 9.5 db. At installations where service conditions require other values than those quoted on any or all of the legs of the bridge, corresponding changes should be made in the basic requirements given in this Section for tests involving repeaters and switching pads.

3. TESTING METHODS

(A) 1000-Cycle Measurements

Resistance Multiple Loss

3.01 The 1000-cycle measurement on the resistance multiple is made from one leg to any other leg, with the remaining legs terminated at the line jacks of the repeaters with 217D plugs (600 ohms) as indicated schematically in Fig. 1.

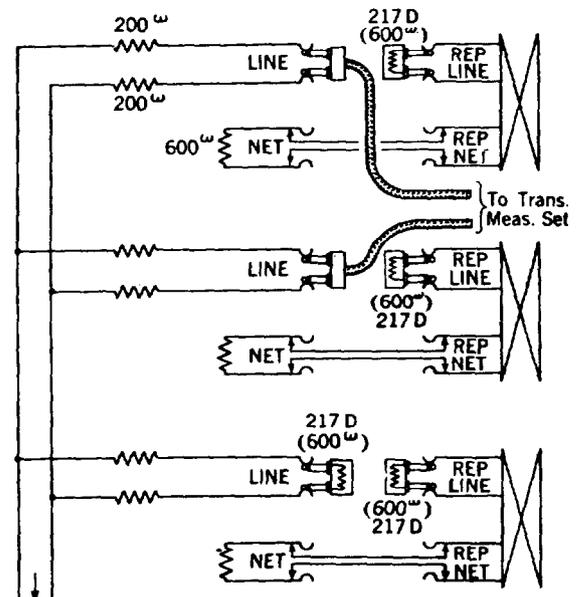
1. GENERAL

1.01 This Section covers the method of testing the six-outlet repeater toll conference grouping circuit at switching pad, non-gain and cord circuit repeater offices, and includes the requirements and limits for each test.

1.02 This issue replaces Issue 2 of this section, the principal changes being to include references and requirements for non-gain and cord circuit repeater offices and also to include references and requirements for volcas equipped branches.

1.03 Section 332-430-300 covers the suggested application of these tests in connection with the maintenance of the toll conference grouping circuit.

1.04 Section 332-430-100 covers the description of the toll conference grouping circuit.



To Remaining Legs of Resistance Multiple. Each Terminated with 600 ohms.

Fig. 1.

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Requirements: The measured loss between any two legs with the other legs terminated in 600 ohms should be 14.0 ± 0.5 db.

Repeater Gain

3.02 The 1000-cycle gain of each repeater should be measured in accordance with the instructions set forth in the Section covering the methods of making tests on 22A1 repeaters.

Requirements: The measured gains of each repeater should be within ± 0.3 db of the value specified on the circuit layout record card covering the conference grouping circuit.

Drop Circuit and Switching Pad Loss

3.03 The 1000-cycle measurement on each drop circuit should be made between the drop side of the repeater and the switchboard for the following two conditions:

- (1) Switching pad out.
- (2) Switching pad in.

Requirements:

- (1) **Drop Circuit:** The measured loss of the drop circuit with the switching pad out should conform with the normal value for the office.
- (2) **Switching Pad:** The increase in measured loss due to the switching pad should not differ from the designated value by more than ± 0.4 db.

Grouping Circuit Overall Loss

3.04 The 1000-cycle measurement on the overall grouping circuit is made from the switchboard jack of one leg, through the grouping circuit, to the switchboard jack of any other leg with the switching pads in. The remaining legs should be in the normal idle condition at the switchboard. (The idle condition of the switchboard jack provides the proper termination for the leg.) Fig. 2 shows schematically the conditions for making this test.

Requirements: The measured loss between any two legs with the switching pads "In" should be 10.0 db plus twice the nominal office drop loss ± 1.0 db. (Where repeater gains or pad values other than those specified in Para-

graph 2.01 are used, the 10.0 db figure should be adjusted accordingly.)

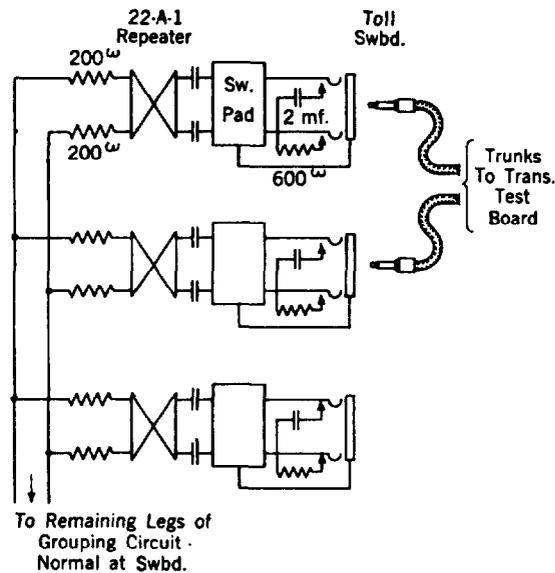


Fig. 2.

Disabling and Holding Feature

3.05 The disabling and holding feature is checked by means of a 1000-cycle measurement similar to that of Paragraph 3.04 above, but with a toll cord plugged in to the special disabling jack.

Requirements: The measured loss between any two legs should be at least 30 db.

One-Way Feature

3.06 The one-way condition is measured by plugging an idle toll cord into the one-way jack and measuring 1000-cycle transmission from the switchboard jack of one leg to the switchboard jack of any other leg, with the switching pads in.

Requirements: The measured loss from the incoming leg to any outgoing leg should be the same as measured according to Paragraph 3.04 above. From any outgoing leg to any other leg, (including the incoming leg) the measured loss should be at least 30 db.

(B) Gain-Frequency Measurements

Repeater

3.07 The gain-frequency measurement of each repeater should be made in accordance with the instructions set forth in

the Section dealing with methods of testing 22A1 repeaters.

Requirements: Both sides of each repeater shall conform to the following limits at the indicated frequencies:

Freq.	DB Deviation from 1000-Cycle Gain					
	Minimum		Normal		Maximum	
	W-E	E-W	W-E	E-W	W-E	E-W
300	-1.0	-1.0	-0.4	-0.4	+0.2	+0.2
500	-0.2	-0.2	0	0	+0.2	+0.2
1600	-0.2	-0.2	0	+0.1	+0.2	+0.3
2200	-0.4	-0.2	0	+0.2	+0.3	+0.6
2600	-5.2	-0.1	-2.2	+0.5	-0.2	+1.1

Note: The typical equalizer setting to give the above characteristics is: Leads "L," "F" and "R" are all connected to terminal 1 of the 82G retard coil.

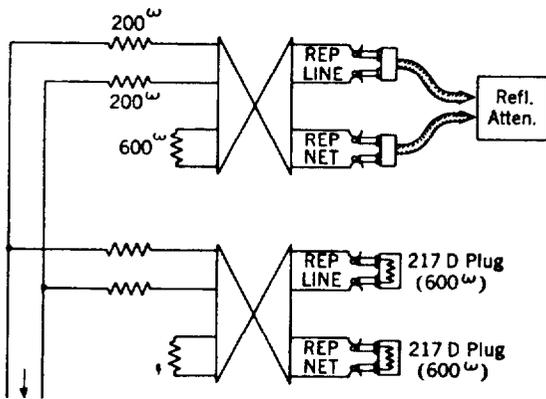
(C) Passive Singing Point Tests

3.08 The passive singing point tests are made by using a test repeater and reflection attenuator (or equivalent arrangement) patched in place of the repeater on the leg to be tested. The use of a test repeater will avoid the necessity of changing the gain adjustment of the regular repeater. The test repeater should have Type 13C filters and preferably a gain-frequency characteristic similar to the regular repeater. Where a test repeater is not available, the regular repeater associated with a non-volcas leg may be used.

Resistance Multiple

3.09 A passive singing point test should be made on each leg of the resistance multiple with the other legs terminated on the drop sides of their respective repeaters by the use of 217D plugs (600 ohms) in the REP LINE and REP NET jacks.

3.10 Fig. 3 shows schematically the connections and arrangements for making



To Remaining Legs of Grouping Circuit Arranged with 600 ω in REP LINE and REP NET on Drop Side of Repeater.

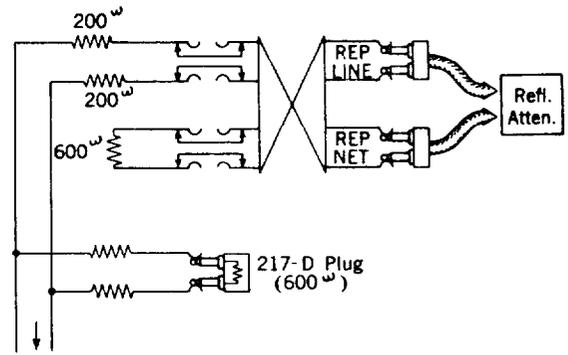
Fig. 3.

the singing point tests on a leg of the resistance multiple.

Requirements: The singing point of any leg of the resistance multiple with the other legs terminated in their respective passive repeaters should not be less than 30 db.

3.11 If this requirement is not met, replace the repeater termination on each of the legs with a 600-ohm termination, as indicated in Fig. 4, and measure the singing point.

Requirements: The singing point of any leg of the resistance multiple with the other legs terminated by a 600-ohm termination should be greater than 35 db.



To Remaining Legs of Resistance Multiple. Each Terminated with 217-D Plugs.

Fig. 4.

3.12 If a singing point of 35 db or more is obtained, under the conditions given in Paragraph 3.11, it indicates that one or more of the repeaters were the cause of the low singing point on the initial test. These may be located by removing the 600-ohm termination from one leg at a time, reconnecting the repeater termination and making a singing point test. Each substitution of a repeater termination for a 600-ohm termination will slightly reduce the singing point. When the addition of any one repeater causes a decrease in singing point noticeably greater than that caused by any of the others, the input connections to that repeater should be investigated as well as the 600-ohm terminations on its drop side.

3.13 If a singing point less than 35 db is obtained under the conditions given in Paragraph 3.10, the resistances and wiring of the resistance multiple should be checked and, if necessary, measured to insure that all resistances are of the proper value and that the tip and ring sides are balanced.

Drop Circuit

3.14 The passive singing point tests on each drop circuit are made for the three following conditions and in accordance

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with other Sections of these Practices covering the measurement and adjustment of singing points on drop circuits at switching pad offices or in accordance with Paragraph 3.15 where that condition applies.

- (1) To a through test drop with its repeater terminated with 217D plugs (600 ohms) in the REP LINE and REP NET jacks on the side away from the drop circuit being tested.

Requirements: The measured singing point of the drop circuit for this condition should be at least 15 db.

- (2) To an idle condition at the switchboard.

Requirements: The measured singing point of the drop circuit for this condition should be at least 15 db.

- (3) From a through test drop with the repeater in the grouping circuit terminated with 217D plugs (600 ohms) in the REP LINE and REP NET jacks on the resistance multiple side.

Requirements: The measured singing point of the drop circuit for this condition should be at least 20 db.

3.15 If the office cabling on the drop circuit is considerably less than that normally associated with a toll circuit in the particular office, it will be necessary to build out the drop circuit as follows:

- (1) Measure the capacitance of the drop circuit at 2000 cycles in the manner outlined in the Sections referred to in Paragraph 3.13.
- (2) Add capacitance to the particular drop circuit equal to the difference between the value measured in (1) and one-half the capacitance of the building-out unit connected in the telephone repeater network of a normal toll circuit in the office.

(D) Active Singing Point Tests

Grouping Circuit

3.16 The active singing point tests are made on each leg of the grouping circuit. The through test drop with a reflection attenuator (or equivalent arrangement) is connected at the toll switchboard to one leg of the grouping circuit. The jack appearances at the switchboard of the other legs of the grouping circuit remain in the idle condition. Fig. 5 shows schematically the arrangement for making an active singing point test on one leg of the grouping circuit.

3.17 The sleeve of the through test drop is normally wired for a via condition and as a result the switching pads in both the test drop and the grouping circuit leg being tested are removed from the connection.

Requirements: The active singing point of the grouping circuit measured on any leg should be not less than the following:

Switching Pad Office (or Non-Gain Office)

<u>Non-Volcas Leg</u>	<u>Volcas Leg</u>
15 db	16 db*
<u>Cord Circuit Repeater Office</u>	
6 db	8 db*

* The volcas values are higher due to the added loss of the volcas legs in the passive condition. Singing will probably be intermittent due to volcas operation.

(E) Service Performance Tests

3.18 Upon completion of all technical measurements required on the grouping circuit at the time of circuit order or service cutover tests, a service performance test should be made with the grouping circuit for the following two conditions.

- (1) With one station locally connected and five stations, each connected by a separate direct toll circuit.
- (2) With six local stations.

Requirements: Acceptable transmission should be obtained between all stations for each of the above conditions.

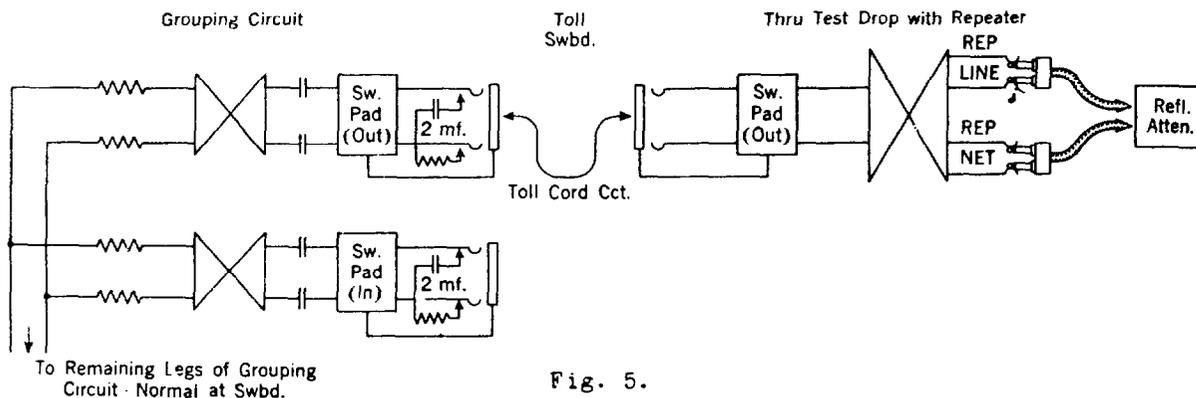


Fig. 5.