TOLL CONFERENCE GROUPING CIRCUIT

SIX-OUTLET ARRANGEMENT WITH REPEATERS

SWITCHING PAD, NON-GAIN AND CORD CIRCUIT REPEATER OFFICES

CONTENTS PAGE

1. GENERAL 1
2. RESISTANCE MULTIPLE 2
3. TELEPHONE REPEATERS 2
4. HOLDING AND DISABLING CIRCUIT, AND FEATURE FOR CONVERTING THE BRIDGE TO A ONE-WAY CIRCUIT 3
5. DROP AND TRUNK CIRCUITS 3
6. OPERATION 3

1. GENERAL

1.01 This section describes a toll conference grouping circuit which permits the interconnection of as many as six via grade toll circuits and toll connecting trunks. Its object is to provide toll conference service permitting talking and listening from any of the several interconnected stations. In addition, an optional circuit is available which permits the translation of this bridge to a one-way conference bridge for use principally as a fanning out point for large one-way conferences.

1.02 This issue replaces Issue 2 of this section. The principal changes are references to conditions involving non-gain and cord circuit repeater offices, conference branches equipped with a volcas circuit (Section 332-432-100) and also one-way conference features.

1.03 Other sections of this series of practices cover respectively the maintenance routines and the testing methods applying to this equipment.

1.04 Fig. 1 shows in schematic form the general arrangement of the grouping circuit described in this section. Each of the branches is identical in makeup and consists of a leg from the resistance multiple, a two-wire repeater and a drop circuit. Any of the branches equipped with a volcas circuit would differ from the others only in that a different switching pad would be used.

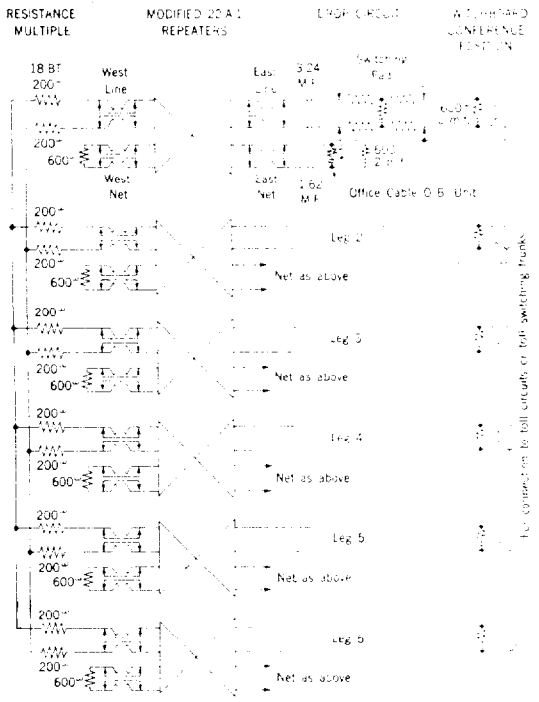

Fig. 1

1.05 The circuit is shown in more detail on the application schematic Drawing SD-64624. This drawing in Fig. 1 shows the arrangement of one of the conference branches using a volcas, whereas the second figure indicates a branch not equipped with a volcas. Fig. 3 shows the arrangement of the resistance multiple and the holding and disabling circuit. Other figures on the drawing cover the balancing network circuits, monitoring features and the circuit for converting the bridge to one-way operation.

1.06 The bay equipment arrangements of the conference equipment and the detailed arrangements of the various circuit units mentioned in 1.05 are shown on Drawing ED-64624. Provision is made for mounting the six 22 type repeaters, jack field

equipment and as many as four volcas units. The miscellaneous resistances, relays and coils used for the conference resistance multiple, battery supply circuits, monitoring and alarm circuits, together with the mounting plate containing the equipment for transferring the bridge to one-way operation, are mounted at the top of the rack.

1.07 The conference circuit is suitable for use in No. 1 or No. 3 toll switchboards at pad control points, non-gain switching points and cord circuit repeater offices. The differences between the circuits apply only to some of the features of the trunk circuits. For non-gain switching points and switching pad offices the repeater gains and switching pad values are the same. For cord circuit repeater offices there are some differences in these particulars.

2. RESISTANCE MULTIPLE

2.01 The resistance multiple consists of six branches. There is a 200-ohm series resistance in each side of each branch. These resistances, in conjunction with the input impedances of the repeaters, provide a constant impedance network of approximately 600 ohms.

2.02 The transmission loss between any two branches through the multiple including the 200-ohm resistances and with 600-ohm terminations on the remaining four branches will be 14.0 db.

2.03 Each branch of the resistance multiple is normally wired to the line jacks of the west side of the two-wire repeater.

3. TELEPHONE REPEATERS

3.01 A two-wire telephone repeater equipped with a 13C-type filter in the west-to-east direction and with no filter in the east-to-west direction is provided for each branch. No signaling unit or ringer is provided. The repeater is wired between the resistance multiple and the drop circuit and the normal gains between the repeater jacks are as follows:

	Non-Volcas Branch	Volcas Branch
At Switching pad or non-gain switching points	6	8.5
At Cord circuit Repeater points	9	11.5

3.02 The repeaters are modified by the addition of a shunt bridged across the monitoring windings of their output transformers, as shown in the following table:

Type Output Trans.	Blocking Condenser	Values of Resistance: West Output Trans.	Values of Resistance: East Output Trans.	Values of Capacitance: West Output Trans.	Values of Capacitance: East Output Trans.
		Non-Volcas Repeaters			
123-C	3.24 mf.	300 ohms	200 ohms	None	1 mf.
104-AA	3.24 mf.	300 ohms	200 ohms	None	.5 mf.
		Volcas Equipped Repeaters			
123-C	3.24 mf.	None	None	None	1 mf.
104-AA	3.24 mf.	None	None	None	.5 mf.

In addition, the volcas equipped repeaters have resistances of 111 ohms connected in series with the tip and ring conductors between the repeater and the jacks on both sides of the repeater. A 221-ohm resistance is used in the network circuit to balance these resistances. The purpose of the above-mentioned resistances is to cause the repeater, as seen from the resistance multiple, to look like 600 ohms impedance. The impedance of the repeater witnout these resistances is lowered, due to the action of the volcas circuit.

3.03 The west side of the repeater is connected to the resistance multiple and its balancing network of 600 ohms.

3.04 The east side of the repeater is connected to a drop circuit described below and to a balancing network of the usual compromise type.

3.05 On the east side of the repeater, the output transformer is reversed for alternate legs of the conference circuit, normally legs 2, 4 and 6. This reversal is accomplished by connecting terminals 4 and 7 of the output transformer to the tip and ring, respectively, of the repeater jacks.

3.06 Both sides of the repeater are equalized to conform with the gain frequency limits given in paragraph 3.07 of Section 332-430-300.

4. HOLDING AND DISABLING CIRCUIT, AND FEATURE FOR CONVERTING THE BRIDGE TO A ONE-WAY CIRCUIT

4.01 An additional jack associated with the No. 1 jack is provided at the switchboard appearance which, when the plug is inserted, functions to make the bridge inoperative. This is accomplished by means of relays which short-circuit the bridge points of the west output transformers of all the repeaters, as shown on Drawing SD-64624, Fig. 3. Fig. 5 on Drawings SD-64623 and SD-64625 shows the trunk unit portion of these holding and disabling circuits.

4.02 An optional arrangement is available, as indicated on Drawing SD-64624, which converts the bridge to a one-way bridge when such connections are desired. This is accomplished by relays which function to make the first branch of the bridge operative only in the incoming direction, whereas the remaining five legs of the bridge are made operative only in the outgoing direction. This one-way condition is established by plugging into a special jack at the switchboard, the sleeve circuit of which energizes relays which perform the desired function. Fig. 6 on Drawings SD-64623, SD-64624 and SD-64625 shows the details of this circuit.

5. DROP AND TRUNK CIRCUITS

5.01 The drop circuit of each branch is connected to the line jacks of the east side of the repeater and terminates in a jack at the switchboard.

5.02 The equipment in the drop circuit consists of balanced blocking condensers of 3.24 mf. in the tip and ring. The switching pad included in the drop circuit is usually 4 db for non-volcas branches and 6.5 db for volcas equipped branches. In cord circuit repeater offices, the pads are usually 7 db for the non-volcas branches and 9.5 db for the volcas branches. For the idle condition, a termination is furnished which consists of 600 ohms in series with 2 mf. connected through a relay contact across the tip and ring of the toll line drop circuit to provide a balanced condition for the repeater in that branch.

5.03 Figs. 1, 2 and 3 on Drawings SD-64623 and SD-64625 show the truck circuits for use at pad control offices, non-gain switching offices or cord circuit repeater offices with No. 1 or No. 3 switchboards. It will be noted that in the No. 1 toll switchboard the 600-ohm termination mentioned in 5.02 is obtained by replacing the 172B relay in the toll line circuit with a 600-ohm resistance and 2 mf. condenser in series. At No. 3 toll switchboards a termination is already available as a standard arrangement, consisting of 600 ohms and 1 mf. in series. It is only necessary, therefore, to change this latter condenser to 2 mf. when converting existing trunks to trunk circuits for conference use. (Some of the older No. 3 toll boards were equipped with 1,200 ohms and a .5 mf. condenser. Where this is the case a change should be made to agree with the above.)

5.04 The switchboard jacks of each branch usually appear in the toll line multiple of the through board. When these jack appearances are multipled the remaining jacks should be plugged with signal plugs.

5.05 The drop circuit is balanced with a compromise network of 600 ohms and 2 mf. in series, which is bridged with an office cable building-out unit. 1.62 mf. is connected in series with one side to balance the 3.24 mf. blocking condensers in the drop circuit.

6. OPERATION

6.01 To furnish toll conference service to groups where more than six subscribers are involved, grouping circuits in the same office or in different offices may be interconnected depending on the geographical distribution of the stations.

6.02 In offices provided with more than one grouping circuit, the legs of the grouping circuits to be interconnected are so designated to the operator that a volcas equipped leg of one bridge is used to connect to a non-volcas leg in the other bridges. Where conference grouping multiples in different offices are to be used, connection between the two bridges is obtained by means of a via grade toll circuit, volcas equipped branches being used at both ends of this circuit.