

CIRCUIT DESCRIPTION

CD-65719-01
Issue 6D
Appendix 1D
Dwg Issue 7D

PBX SYSTEMS
NO. 550B, 550C, 550SC, 551A, 551B, 551D,
552A, 552B, 552D, 552E, 555, 556A,
605A, 606B, 607A, 607B, OR 608A
MANUAL CONFERENCE CIRCUIT
WITH VOICE REPEATER
ARRANGED FOR A MAXIMUM OF
4 OR 5 SIMULTANEOUS CONNECTIONS
(MAN CONF)

Drawings for SD-65719-01 have been converted to 8-1/2 by
11 inch handbook size.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5336-LEVD-EVDL

PLEASE NOTE AND RETURN:
BURNS, J. G. 3
DINS, C. C.
JACK ON C. C. 5
KLAISS, R. J.
PERRIN, R. B. 7

PBX SYSTEMS
NOS. 550B, 550C, 550SC, 551A,
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CHANGES

B. APPARATUS

B.1 Added:

Res. "SL1", "SL2", "SL3"
145A 37900
Option "G"

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Title changed to add 608A PBX.

D.2 Circuit Note 102 revised to include G & H options.

D.3 Connecting information for Fig. 1 revised to make circuit compatible with the 608A PBX.

1. PURPOSE OF CIRCUIT

1.1 This is a manual conference circuit for use with PBX switchboard cords and providing means for a conference between a maximum of five stations, four stations and one central office trunk or tie trunk, three stations and two central office trunks or tie trunks, or three stations and one central office trunk and one tie trunk. The circuit is equipped with a voice repeater to increase the volume level in the talking circuit.

1.2 Two of these manual conference circuits may be connected together either by a grouping key (Fig. B) or by permanent wiring (Fig. A) when it is desired to use 2 circuits to form a 10 branch conference circuit. Some degradation of transmission results from the connection of 2 of these circuits to form a 10 branch conference circuit..

2. WORKING LIMITS

2.1 None

3. FUNCTIONS

3.1 To provide talking and signaling battery to the PBX cord connected to "station jacks."

3.2 To provide for tripping machine ringing and extinguishing the supervisory lamp in the cord circuit connected to "trunk and station" or "trunk" jacks.

3.3 To provide a conference transmission circuit.

3.4 To provide a means for increasing the volume level in each of the talking paths.

3.5 To provide for permanently wiring 2 of these circuit together to form a ten branch conference circuit, and to energize both repeaters from either circuit when so connected.

3.6 To provide for grouping 2 of these circuits together by means of a grouping key under control of the attendant when a 6 or more branch conference is required.

4. CONNECTING CIRCUITS

When this circuit is listed on a key-sheet the connecting information thereon is to be followed.

4.1 Cord Circuit - SD-66198-01*.

4.2 Transmission Measuring E Repeater Test Set - SD-95204-01.

4.3 Manual Conference Circuit - SD-65738-01.

*Typical

DESCRIPTION OF OPERATION

5. METHOD OF CONNECTION

The "station" jacks are for connecting three local stations together. The "trunk and station" or "trunk" jacks are used when four or five local stations are required in the conference or for either central office trunk or tie trunk connections. The front cords of the required number of cords are inserted into the jacks of the conference lines. The rear cords are then used to call the subscribers required in the conference.

6. OPERATION

When a PBX cord is inserted into a (STA-) jack the associated (S-) relay operates from the cord bridge to remove the idle circuit termination, close the talking path through to the amplifier or connect another station into the talking path and supply power to the heater and plate of the repeater tube. Talking battery is supplied from this circuit to the subscribers station through the (S-) relays. If no tie trunk or central office trunk connection is to be added, the (T1) or (T2) resistances are maintained across the tip and ring of the (TRK-) jacks to complete the talking path for the PBX stations in the conference. When tie trunks, a central office trunk, or other PBX stations are added to the three stations already in series, the associated (T-) relays operate over the sleeves of the cords to remove the resistance across the tip and ring and place the tie trunks, central office trunk, or stations in multiple with the three PBX stations. The retardation coils are furnished to trip machine ringing when the plugs of the cords are inserted in trunk jacks and to prevent the supervisory lamp in the cord circuits from lighting. When these jacks are used for station connections, battery is supplied to the station from the cord circuits.

7. OPERATION OF THE VOICE REPEATER

7.1 General

The repeater consists of three parts, the transformer, the amplifier unit, and the gain adjusting network. The transformer has four windings two of which are balanced and connected in series with the tip and ring leads of the multipled stations in the conference. The second pair of windings are connected to the cathode circuits of the twin triode vacuum tube.

The amplifier unit consists of the vacuum tube, vacuum tube mounting base, and the various resistors and condensers associated with the control of the vacuum tube. The heaters for the tube are arranged for use with 6.3 volts ac power supply. The plate circuits are connected through resistances to the gain adjusting network.

The gain adjusting network consists of an arrangement of inductances, condensers and resistances. By variation in the wiring of these elements of the network the gain of the circuit is controlled to conform with the requirements of the associated circuit. The gain of the repeater at any frequency is a function of the impedance of the network and the sum of the impedances of the conference circuit

connected to the repeater. The nearer the network impedance, times a transformation factor, resembles the sum of the two line impedances the greater will be the gain.

7.2 Testing and Monitoring of Repeater

The (C1), (C2), and (P-) jacks in the repeater are provided for voltage testing and monitoring purposes. Fig. 13 is to provide connections through a connector and cable to the test set for the E2 repeater. Power for the test set is provided from the TEST SET PWR plug on the power supply unit.

8. DISCONNECTION

When the receivers are replaced on the switchbooks at all stations, the attendant is furnished disconnect signals on the PBX cords which connect the stations to the conference circuit. On central office trunk and tie trunk connections, no supervision will be provided. The attendant then removes the cords from the jacks which releases all operated relays and restores the circuit to normal.

9. BUSY TEST

When the multiple jacks are used, it is necessary for the attendant to test this circuit for busy in the usual manner.

10. OPERATION AS A 10 BRANCH CONFERENCE CIRCUIT

10.1 Permanently Wired Connection

In this case, two Figs. 1 are provided, and their M1 & M2 leads are connected together to series the primary sides of the repeater input transformers. In order to prevent the second repeater from imposing a loss on the first circuit in the event that 5 or less connections are made in one circuit only, lead F1 and P1 connect the two Figs. 1 together to energize both repeaters from either circuit.

All other functions are as described for 5 branch operation.

10.2 Grouping Key Operation

In this case two Figs. 1 are provided and their M1 & M2 leads are connected via the grouping key Fig. B whenever the attendant requires more than a 5 branch conference connection. Under this arrangement, leads F1 & P1 are not connected because there is no reason to operate the group key unless more than five branches are required and this will result in at least one

connection in each five branch circuit which will energize both repeaters.

All other functions are as described for 5 branch operation.

11. MISCELLANEOUS

11.1 The Power Supply shown in Fig. 3 is arranged so as to be operated on AC power supply from 110 to 120 volts. Options are also given for a larger current

output to the rectifier to allow for use of the power supply in conjunction with more than two Figs. 1 and to allow for a larger voltage input to the rectifier when aging has occurred to the degree that the rectifier requires a larger impressed voltage. Resistance (P1) is adjusted so that the full load voltage (all repeaters on) of the power supply will be 120 volts.

11.2 Resistance (R) and (F) are provided to limit the heater voltage of the twin triode tube to 6.3 volts.

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