COMMON SYSTEMS
LINE AND BALANCING
COMPROMISE AND BALANCING NETWORKS
FOR USE WITH EXCHANGE AREA CIRCUITS
OR ATTENDANTS TELEPHONE SETS

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The designation (MFR. DISC.) is placed below the figure number of Figs. 3 and 4. These figures were rated "Manufacture Discontinued" on a previous issue, but the above detail was omitted.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT. 2161-MAP-LP-RHD

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OR ATTENDANTS TELEPHONE SETS

CHANGES

B. CHANGES IN APPARATUS

B.1 Added (Optional)

In Figure 1

1 - Network (ELN) or (WLN) 115 CE

In Figure A

1 - Network (ESN) or (WSN) 115 BL

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Table A was revised, table C was rated "Mfr. Disc.", and table D was added in accordance with B.1 above.

D.2 Note 103 was revised to specify table D.

All other headings under Changes, No change.

1. PURPOSE OF CIRCUIT

1.1 One purpose of this circuit is to show trunk, compromise and subscriber set balancing networks for use with voice frequency repeaters in loaded or non-loaded exchange area facilities.

1.2 A second purpose of this circuit is to show networks for balancing attendant's telephone sets for order wire circuits.

2. WORKING LIMITS

2.1 None.

3. FUNCTIONS

3.1 Provides a means of building up a trunk balancing network for use on loaded and non-loaded exchange area circuits equipped with voice frequency telephone repeaters.

3.2 Provides a means for balancing attendant's telephone sets on repeatered order wire circuits.

4. CONNECTING CIRCUITS

When this circuit is listed in a keysheet the connecting information therein is to be followed.

4.01 Line Balancing Networks SD-60963-02.

4.02 Cable Gas Pressure Alm. and Cabling in Circuit SD-55211-01.

4.03 Repeater By pass Ckt. 55311-01.

4.04 V1 Telephone Repeater Term. Ckt., application schematic SD-64903-01.

4.05 PBX or Long Subs. Lines or Long Trunk Circuits or Order Wire Circuits.

4.06 D.C. Loop Signaling Order Wire - Application Schematic, SD-55385-01.

4.07 SD-56073-01 Telephone Set Circuit for "L" order wire.

4.08 SD-56139-01 Telephone Set Circuit for "L" order wire.

4.09 Toll Switching Systems #4 and #4A.

4.0901 SD-68242-01 Outgoing Trunk

4.0902 SD-68303-01 Outgoing Trunk

4.0903 SD-68315-01 Incoming Trunk

4.0904 SD-68318-01 Incoming Trunk

4.0905 SD-68325-01 Outgoing Trunk

4.0906 SD-68326-01 Outgoing Trunk

4.0907 SD-68357-01 Incoming Trunk

4.0908 SD-68358-01 Incoming Trunk

4.0909 SD-68331-01 Incoming Trunk

4.0910 SD-68332-01 Outgoing Trunk

4.10 D-C Loop Sig. Tel. Order Wire SD-55747-01.

4.11 V3 Tel Rep & non-repeatered line & Balancing Appl. Schematic - SD-95144-01.

DESCRIPTION OF OPERATION

5. GENERAL

The proper operation of voicefrequency repeaters requires that the lines in each direction from the repeater be accurately balanced by artificial lines, and networks,

which simulate, over the voice frequency range, the characteristic impedance of a toll line and the intermediate equipment between the repeater terminals and the line itself.

Due to the comparatively short length of lines, the less severe service requirements, and the greater loading coil spacing and cable capacitance deviations in exchange area circuits, balancing networks cannot simulate actual trunk impedances as accurately as is the practice in the toll plant. For this reason, repeater gains are kept fairly low and the networks designed on a compromise basis.

6. Figure 1 indicates a trunk balancing network and in conjunction with table A provides the correct network for the various loaded lengths of exchange area cable which are likely to be employed with telephone repeaters.

7. Figure 2 shows a network section designed to simulate short sections of non-loaded exchange area cable. The (EBO) or (WBO) condenser is provided for the purpose of balancing the non-loaded cable closer than the balance afforded by the 1/2 mile sections of the network. Figures A, B or C are used to terminate one or more figures 2, connected in tandem, to simulate the termination of short non-loaded cables by subscriber's sets, toll office, or local office impedances, respectively. The balance in the latter cases will undoubtedly be poor due to the complexity of the office impedances. In all such cases, however, it will be possible to obtain fairly good balance against the trunk connected to the other side of the telephone repeater and thus obtain satisfactory operation of the telephone repeater at low gains.

8. Figure D is provided for the purpose of balancing a 94E battery supply repeating coil.

9. Figures 3 and 4 show networks designed to simulate attendants' telephone sets to obtain improved balances on repeatered order wire circuits at two-wire points where the attendants' telephone sets are used. Two Figures 3 or two Figures 4 may be used to balance each other during idle periods when no attendant's telephone set is connected to the circuit.

10. Fig. 5 is a Tel. Set Bal. Network similar to Figure 3 but designed to give better balances for long order wire circuits used with Type L Carrier. It will balance F3TW handsets and J2A operator sets empolyed with the 178D induction coil.

11. Figure 6 replaces Figure 5 in order to provide improved balance against order wire telephone set circuits and various test board circuits involving Type L order wire circuits.

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