COMMON SYSTEMS DISTRIBUTING CIRCUIT FOR SUBCENTER ANNOUNCEMENT SYSTEM NO. 9A WITH LOOP OR E AND M LEAD SIGNALING

TABLE OF CONTENTS

SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

This circuit provides means for distributing the control signals and amplifying the announcement received from an announcement machine located in a distant office to a number of announcement trunk circuits.

SECTION II - DETAILED DESCRIPTION

1. SUBSCRIBER ORIGINATES A CALL TO AN ANNOUNCEMENT TRUNK

When a call is received on one of the announcement trunks, ground is connected to the ST lead to operate relay ST through front contacts of relay ALM. Relay ALM is normally operated if the announcement machine or distributing circuit is not in trouble.

2. SIGNALS TO MAIN CENTER

After a call has been received as explained above the circuit proceeds to signal the main center that a call is waiting.

2.1 Loop Signaling

With Relay ST Operated:

(a) Closes in part a path to the windings of relays R-.

(b) Connects relay P to the tip and ring as an indication to the main center announcement machine that a call is waiting.

For a short interval before each announcement the P relay will operate over the loop from the main center.

Relay P operated:

(a) Operates relay RV.

Relay RV operated:

(a) Operates relays R-.

Relays R- operated:

(a) Grounds lead CT to the trunk circuit.

This ground is used by the trunk to cut through to this announcement machine and to count the number of announcements received.

(b) Operated relay E-.

Relay E- operated:

(a) Operates relay RAB.

Relay RAB operated:

(a) Closes ground on the CT lead to the alarm circuit. If all of the R relays do not operate on a CT pulse, lead CT to the alarm circuit will not be grounded and the alarm circuit will function to bring in an alarm.

During the announcement relay RV will release, releasing relays R-.

Relays R- released:

(a) Removes ground from the CT lead to the trunk circuit.

(b) Releases relay E-.

Relay E- released:

(a) Releases relay RAB.

Relay RAB released:

(a) Opens the CT lead to the alarm circuit to stop this circuit from going to alarm. Should any of the R relays fail to release lead CT to the alarm circuit will remain grounded and the alarm circuit will function to bring in an alarm.

2.2 E and M Lead Signaling

With relay ST operated:

(a) Closes in part a path to the windings of relays R-.

(b) Changes the potential on the M lead from direct ground to resistance ground in parallel with 48 volts. This will signal the main center that a call is waiting.

Relay E is normally held operated under control of the main center. A short interval preceeding each announcement this relay is released.

Relay E released:

(a) Completes the path to operate the R-relays.

Relays R- operated:

(a) Grounds lead CT to the trunk circuit.

This ground is used by the trunk to cut through to this announcement machine and to count the number of announcements received.

(b) Operated relays E-.

Relays E- operated:

(a) Operates relay RAB.

Relay RAB operated:

(a) Closes ground on the CT lead to the alarm circuit. If all of the R relays do not operate on a CT pulse, lead CT to the alarm circuit will not be grounded and the alarm circuit will function to bring in an alarm.

During the announcement relay E will reoperate, releasing relay R.

Relay R released:

(a) Removes ground from the CT lead to the trunk circuit.

(b) Releases relay E-.

Relay E- released:

(a) Releases relay RAB.

Relay RAB released:

(a) Opens the CT lead to the alarm circuit to stop this circuit from going to alarm. Should any of the R relays fail to release lead CT to the alarm circuit will remain grounded and the alarm circuit will function to bring in an alarm.

3. BARGE-IN FEATURE

If the barge-in feature is provided on the trunks relays BA- and CA- are provided. These relays are operated to normally operated relay ALM.

Should the alarm circuit move to alarm, ground will be removed from lead AL releasing relay ALM. In turn the barge-in relays BA- and CA will release removing ground from lead ALM to the trunk circuit. This prevents any further subscribers from being connected to the announcement system until the alarm condition is removed.

4. END RELAY

End relay E1 is provided as a check on relay R1 to R10 to insure that these relays operate and release once during each announcement cycle. Should an R relay fail to do so the E- relay will follow suit, thus

facilitating the isolation of the R relay in trouble. Relay E2 performs a similar function for relays R11 to R20 and so forth.

5. TESTING FACILITIES

5.1 Volume Indicator

A volume indicator meter is provided which is connected across the load. With the circuit operating normally the meter will read between approximate limits -6 to 0 with a plug plugged into the MON jack.

5.2 Testing Jacks

The (AMP OUT), (IN), (LINE) jacks are provided for transmission testing and the (MON) jack is provided to allow the maintenance force to monitor on the output to the trunks and for reading the volume indicator meter.

6. EQUALIZERS (LOOP SIGNALING ONLY)

The trunks to distributing centers should be 16-, 19- or 22-gauge nonloaded circuits equalized for a variation of 2 db from 200 to 500 cycles. In a majority of cases it is expected that 19- or 22-gauge will be used. No additional equalization should be required for 16-gauge cable of 6 miles or less for 19-gauge circuits of three miles or less or for 22-gauge circuits of two miles or less.

The longer circuits should be equalized. A 23A equalizer is supplied for this purpose. With this equalizer the maximum trunk lengths that can readily be equalized for a variation of 2 db between 200 and 500 cycles are as follows:

16 miles of 16-gauge,
10 miles of 19-gauge,
7 miles of 22-gauge.

For longer lengths of trunk, intermediate repeaters are required.

The equalizers must be adjusted with the aid of transmission test instruments in accordance with the information published on this system.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.1 Maximum conductor loop resistance of the T and R leads from the announcement machine to the announcement trunk - 0.4 ohms.

1.2 Maximum external circuit loop - 4450Ω. (loop signaling only)

1.3 Minimum insulation resistance - 15,000Ω. (loop signaling only)

2. FUNCTIONS

2.1 Arranged to close a bridge (loop signaling) or a potential change on the M lead (E and M signaling) on this trunk to the outgoing announcement trunk circuit at the main center, whenever an announcement trunk is seized at the subcenter.

2.2 Arranged to receive the control signals transmitted by the outgoing announcement trunk circuit at the main center and distribute them to the associated announcement trunk circuits.

2.3 A volume level indicator meter is provided which can be connected across the load.

2.4 Provides for receiver monitoring across the output of the distributing center.

2.5 Arranged to amplify announcements received from the main center.

3. CONNECTING CIRCUITS

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

3.01 Incoming Trunk Circuit - SD-95861-01, SD-95862-01, SD-95863-01, SD-95864-01.

3.02 Outgoing Trunk Circuit to Main Center - SD-95858-01. (loop signaling)

3.03 Outgoing Trunk Circuit to Main Center - SD-95974-01. (E and M signaling)

3.04 Alarm Circuit - SD-95865-01.

3.05 Amplifier - SD-95257-01.

3.06 Composite Signaling Circuit - SD-95048-01.

3.07 DX Signaling Circuit - SD-95487-01.

3.08 Terminating Circuit - SD-96463-01.

3.09 V1 Repeater Application Schematic - SD-64903-01.

3.10 V3 Repeater Application Schematic - SD-95144-01.

3.11 Repeating Coil and Compromise Net. Circuit - SD-95015-01.

3.12 CX Set and Repeating Coil Circuit - SD-95004-01.

3.13 Repeating Coil Circuit - SD-96452-01.

3.14 N1 Carrier Telephone Application Schematic - SD-95121-01,

3.15 O and ON Carrier Telephone Application Schematic - SD-95150-01.

SECTION IV - REASONS FOR REISSUE

CHANGES

A. CHANGED AND ADDED FUNCTIONS

A.1 Provision is added to provide a means for operation over carrier facilities, using E and M lead signaling.

B. CHANGES IN APPARATUS

B.1 Added

E	AJ-5 Relay	Option S
A	13A Resistor Lamp	Option S
K	18BH Resistor	Option S

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The existing wiring and apparatus between the TST jack and the IN jack along with relay RV has been designated Option T, for use with loop signaling.

D.2 Option S is added for use when E and M lead signaling over carrier is required.

D.3 Notes 102, 104 and the Option Index have been changed to cover the new Options T and S.

D.4 The title is changed to add "with loop or E and M lead signaling".

D.5 The shielding is removed from the A and B resistors at the output of the amplifier.

D.6 CAD Figs. 1, 4 and 5 are changed and CAD Fig. 3 is rated Mfr. Disc. to reflect the above changes.

E. CHANGES IN TRANSMISSION TEST REQUIREMENTS

E.1 Transmission Test Requirements Table is added.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT. 2361-JEK-AAB-EP