COMMON SYSTEMS
ALARM CIRCUIT
ANNOUNCEMENT SYSTEM
NO. 8A OR 9A

CHANGES

B. Changes in Apparatus

B.1

SUPERSEDED	SUPERSEDED BY
4D Transistor (A)	8B Transistor (A)

C. Changes in Circuit Requirements Other Than Those Caused by Changes in Apparatus

C.01 Insulate 4B(AL) is added for testing relay AL to prevent transfer of announcement machines by keeping ground off lead M.

C.02 Insulate 4(CT) is added for testing relay CT to prevent interference from sneak paths.

C.03 Insulate 11B(CT1) is added for testing relay CT1 to eliminate sneak path to winding of CT relay.

C.04 Insulate 6M(MJ) is added for testing relay MJ to prevent interference from sneak paths.

C.05 Insulate 8(CT1) and block MN operated is added for testing relay P to eliminate sneak path to winding of relay MN and to prevent the unnecessary release of relay MN.

C.06 Block OS operated is added for testing relay ST to avoid interference from ST lead in the associated distributing circuit.

C.07 Insulate 2(T1) is added for testing relay T to prevent interference from G capacitor.

C.08 Block R operated is added for testing the W- and Z- relays to eliminate interference from the interrupter or timing circuits.

C.09 Block AL operated is added for testing the Z- relays to prevent the false release of relay AL if operated when the Z- relays are tested.

C.10 Block W1 relay nonoperated is added for testing relay Z to prevent W1 relay from buzzing.

C.11 Block W2 relay nonoperated is added for testing relay Z1 to prevent relay W2 from buzzing.

C.12 Test notes 9, 10, 11, and 12 are added for testing various relays and is intended to prevent false sounding of alarms.

C.13 Various changes have been made in the test clip data column and current flow requirements column to correct typographical errors and to show realistic current values.

D. Description of Changes

D.1 The use of the 4D transistor is rated Mfr Disc. and is superseded by the 8B transistor which is added. This change is made without the use of options since the WECo presently shows the 8B as Standard on the associated T- drawing. The 4D transistor will soon be Mfr Disc.

D.2 Option G which was rated Mfr Disc. on Issue 6B is reinstated as Standard. This change is made on a No Record basis since the WECo T- drawing presently shows G option as Standard.

D.3 Notes 102 and 104 are expanded and sheet note 3 is added to sheet -012 in reference to the above.

D.4 Note 106 has been expanded to indicate that when used in a subcenter, the A switch should be set one step above the setting of the alarm circuit in the main center. This change is intended to prevent bringing in a CT pulse alarm in both the main center and the subcenter when two machines are furnished in the main center. The first failure will be picked up in the main center and a transfer of machines will be affected. Therefore, assuming the second machine is functioning properly the CT pulses will be transmitted to the subcenter, and an alarm, when the first machine failed is not required at the subcenter.

D.5 Various changes have been made in the bracket information of FS1 and FS2 to show the proper titles of the connecting circuits.

F. Changes in Description of Operation

F.1 Under SECTION II, change 6. to read:

Regulation of potentiometer G will regulate the time, after failure of voice in bringing in the alarm. This feature is provided with T option. This time

should be set to approximately 1 minute when circuit is located in a main center and to approximately 1-1/2 minutes when circuit is located in a subcenter.

To set the alarm time:

(a) Release AUD RLS key.

(b) Block VA relay nonoperated.

(c) Operate the ST relay.

When relay ST is operated one should start to time until relay VA1 operates. This can be done with a stop watch.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 2366-FPP-RMW

COMMON SYSTEMS
ALARM CIRCUIT
ANNOUNCEMENT SYSTEM
NO. 8A OR 9A

CHANGES

A. CHANGED AND ADDED FUNCTIONS

A.1 Provides a means of bringing in a minor office alarm and a frame alarm, when a false ground is detected on the ring conductor of a No. 9A announcement system trunk.

B. CHANGES IN APPARATUS

B.1 Added:

MNA- AK-4 Relay, App Fig. 7
U- 19RN Resistor, App Fig. 7
TA 2Y Lamp, App Fig. 10
TA GD 2Y Lamp, App Fig. 10
TA AUD RLS 92AG Key, App Fig. 10
TA- 2Y Lamp, App Fig. 8
TA- RESET 92R Key, App Fig. 9

B.2

Superseded	Superseded by
Direct wiring of the following components in FS1 (all "G" option)	(A) KS-19198 connector and KS-19197,L3 plug containing the following components in FS1 (all "F" option).
(A) 529B Cap.	(A) 529B Cap.
(B) 529B Cap.	(B) 529B Cap.
(C) KS-14337 Cap.	(C) KS-14337 Cap.
(C) 140C or 144E Resistor	(C) 140C or 144E Resistor
(A) Transistor 4D	(A) Transistor 4D

D. DESCRIPTION OF CHANGES

D.1 App Fig. 7, 8, 9, and 10 and "H" wiring are added, on an optional basis to provide an additional alarm feature, separate from existing alarms for the No. 9A announcement system trunk SD-95862-01. FS2 of that circuit contains a detector for falsely grounded ring conductors, with provision for acutating a minor alarm when this condition occurs.

D.2 Note 102 is enlarged to include the added features provided by Fig. 7, 8, 9, 10, and H.

D.3 "G" option is designated, rated Mfr Disc. and superseded by "F" option which is added, for the A transistor circuitry (FS1) that has been redesigned for plug in use.

D.4 "E" option is designated, rated Mfr Disc. and superseded by "B" option which is added, to reduce the constant current drain through the B resistor.

D.5 The Job Record Note and the Option Index are enlarged to include changes on this issue.

D.6 Note 101 is enlarged to include fuse C which is added for Fig. 7 and fuse B which is designated for Fig. 1, 2, and 5 or 6.

D.7 Sheet Notes 1 and 2 are added to sheet 2 of the SD.

D.8 In FS1, apparatus option "2" is removed from contacts 5 and 6 of AUD RLS key.

D.9 Equipment Note 201 is added.

D.10 CADs 1 are 3 and changed and CADs 5 and 6 are added.

D.11 Colors are added to the lamps shown in FS1 and App Fig. 1 to make the SD agree with Western Electric Co. manufacturing drawings.

D.12 Under supporting information, J95419H is added.

F. CHANGES IN DESCRIPTION OF OPERATION

F.1 Add paragraph 7.

7. TRUNK ALARM FROM GROUNDED RING

When App Fig. 7, 8, 9, and 10 have been provided, relays MNA- will normally be operated and held to their own contacts.

A ground will be received from a No. 9A announcement trunk over lead "GR-", when a relay in that circuit had operated as an indication of a grounded ring conductor, shunting down relay MNA-.

Relay MNA- released will:

(a) Operate the office minor audible alarm over lead "1".

(b) Light the office minor alarm lamp over lead "3".

(c) Light lamp TA as an indication of a trunk alarm.

(d) Light lamp TA- on the relay rack frame containing the trunk that is in trouble.

To retire this alarm the TA AUD RLS key, which is normally operated, must be restored to normal.

Releasing this key will:

(a) Remove the office audible and visual alarms.

(b) Extinguish lamp TA.

(c) Light lamp TA GD (trunk alarm guard).

Relay MNA- cannot be reoperated until the trunk with an operated alarm relay has been located and the source of trouble cleared or the circuit is taken out of service. This will remove the ground off lead "GR-" and relay MNA- can then be reoperated by momentarily operating the associated TA-RESET key. Reoperating the TA AUD RLS key will extinguish the TA GD lamp and the circuit will now be ready for any further alarms.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 2361-JEK-AAB

COMMON SYSTEMS
ALARM CIRCUIT
ANNOUNCEMENT SYSTEM
NO. 8A OR 9A

CHANGES

D. DESCRIPTION OF CHANGES

D.1 In FS1, the A tube wiring is changed to prevent the firing of this tube without a call being received, causing relays VA1 and VA2 to operate and release repeatedly. The change consists of the following:

(a) Removal of wiring from relay AL contact 9F to the A tube pin 4.

(b) Removal of ground off ST relay contact 9M.

(c) Adding wiring from AL relay contact 9F to ST relay 9M.

(d) Adding wiring from the A tube pin 4 to ST relay 9F.

D.2 The following symbols on the drawing were inadvertently shown incorrectly and are now corrected as follows:

(a) Tubes A and B - pins 1 and 4 were shown reversed.

(b) D capacitor - was shown as a resistor.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 2361-JEK-AAB

COMMON SYSTEMS
ALARM CIRCUIT
ANNOUNCEMENT SYSTEM
NO. 8A OR 9A

SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.1 This circuit provides a means for periodically checking "cut-through" pulses between an announcement distributing circuit and incoming announcement trunks. A check is also made for the presence of an announcement on the announcement bus.

SECTION II - DETAILED DESCRIPTION

1. GENERAL

The associated announcement system provides "cut-through" pulses between the distributing circuit and the trunks to control such functions as trunk cut-through, charging and cut-off. Each pulse is of a short duration occurring before each announcement. This alarm circuit checks that a pulse occurs periodically within a specified time limit depending upon the length of the announcement cycle. Should a pulse fail to appear within this specified time the central office alarm is actuated.

This circuit also checks for the presence of voice on the announcement bus. If voice is absent for a time greater than a specified time determined by a gas tube timing circuit, the central office alarm will be actuated.

1.1 Checking of "Cut-Through" Leads.

Relays AL, MJ, MN and P, and the AUD RLS key are normally operated. This circuit is started by the momentary operation of the RESET key. An incoming call applies ground on lead ST operating relay ST.

Relay ST operated:

(a) Closes ground to the locking circuits on the W and Z relays.

(b) Closes the interrupter lead B or PU5 or timing relay make contact T1 to the W and Z relay's operate path.

(c) Removes the 700-ohm shunt from around Capacitor E to permit it to begin charging.

(d) Closes relay VA1 to the cathode of tube A.

(e) Closes in part a locking path for relay CT and an operating path for relay CT1.

(f) Closes ground to the ST lead of the No. 5 Crossbar Timing Circuit, when provided, to start the one minute interrupter over lead ST. One minute interruptions will be received over lead A, B or PU5, or if the office interrupter is not available Fig. 3 is provided and relay T and T1 will operate for a short duration each minute. A W-Z relay combination counts and recycles after two pulses. The W and Z relays will act once for each two input pulses. Relay Z controls a second pair of W-Z relays (W1 and Z1) and relay Z1 controls a third pair of W-Z relays (W2 and Z2).

For a short duration before each announcement lead CT to the distributing circuit is grounded. This operates relay CT and shunts relay CT1 for the duration of the pulse.

Relay CT operated:

(a) Locks to relay ST operated and R released.

(b) Operates relay CT1 when the pulse is removed from lead CT.

(c) Opens in part a locking path for relay MJ.

(d) Opens in part a path to shunt relay MJ and MN.

(e) Opens in part a path to the distributing circuit lead M.

Relay CT1 operated:

(a) Operates reset relay R.

(b) Removes its own shunt from the CT lead.

Relay R operated:

(a) Resets the W-Z relays.

(b) Releases relays CT.

(c) Places an additional ground on the inner winding of relay AL.

Relay CT released:

(a) Releases relay CT1.

The circuit is now normal and ready to time another cut-through pulse interval. Should the "CT" pulse fail to arrive the W-Z relays will continue to time since relay R will not operate. Depending on where switch A is set, relay AL will release from the contacts of the W-Z relays.

Relay AL released:

(a) Actuates the office alarm over lead 2 when Figure 2 is not provided. (Single Channel)

(b) Releases relay MN.

(c) Places ground on the M lead to actuate a transfer of announcement machines.

(d) Removes ground from lead AL to prevent charging the subscribers.

When the transfer has taken place ground is connected to lead RE. This will cause relay R to operate.

Relay R operated:

(a) Reoperates relay AL.

(b) Resets the W-Z relays.

Relay MN released:

(a) Actuates the minor alarm over lead 1.

Relay AL operated:

(a) Releases relay P.

(b) Opens ground for lead M.

The circuit is now normal and ready to time another CT pulse interval.

Should the CT pulse again fail to appear within a specified interval the AL relay will again release.

Relay AL released:

(a) Releases relay MJ.

Relay MJ released:

(a) Actuates the major alarm over lead 2.

When Fig. 6 is provided and a major alarm condition exists relays TN and TN1 operate. The TN relay operates relays PR and INT. This turns on the busy tone amplifier. This tone is transmitted to subscribers that would ordinarily reach the announcement machine.

When Fig. 5 is provided and a major alarm condition exists, relay A will operate. The "AL" lead causes busy back to be sent to the trunks.

To reset the major or minor alarm the reset key is operated momentarily. This operates relays R, MN and P.

Relay R operated:

(a) Operates relay AL.

(b) Resets the W-Z relays.

2. VOICE FAILURE

(a) When an announcement is sent to the announcement bus, the voice frequencies are amplified by transistor A. Capacitor C by-passes the audio frequencies around the relay winding of V. Relay V operates from voice.

Relay V operated:

(a) Operates relay VA.

Relay VA operated:

(a) Places resistor J across condenser G to discharge it.

Should voice fail relay VA will not operate. Tube A will immediately start timing. After a fixed period of time tube A will fire and cause relay VA1 to operate.

Relay VA1 operated:

(a) Operates relay VA2.

Relay VA2 operated:

(a) Releases relay AL when Option 2 (single channel) is provided and causes a major alarm to be actuated or releases relay MJ when Fig. 2 or dual channel operation is provided.

(b) Releases relay VA1 which in turn releases relay VA2.

(c) Resets the timing tube A.

Should voice fail on either channel of a dual channel machine ground will be received over lead MN. This ground shunts down relay MN and actuates a minor alarm.

3. TIMING CIRCUIT FIGURE 3

If one minute interruptions are not provided in the office Fig. 3 should be furnished.

When relay ST operates tube B starts timing. After a period of about one minute tube B fires and operates relay T.

Relay T operated:

(a) Operates relay T1.

Relay T1 operated:

(a) Releases relay T1.

(b) Deionizes tube B.

(c) Discharges condenser E to reset the timer.

This operation repeats itself causing relay T1 to be operated and released approximately once per minute. Relay T1 in turn passes these interruptions on to the W-Z relays which function as previously described in Paragraph 1.

4. OUT OF SERVICE

When ground is received over the "out-of-service" lead OOS, relay OS will operate.

Relay OS operated:

(a) Opens lead AL to the distribution circuit to stop further charging.

(c) Opens the circuit to the ST relay which prevents the alarm circuit from functioning.

(c) Lights the OS lamp.

When ground is removed from the "out-of-service" lead OOS, the circuit returns to its original state.

5. SETTING OUTPUT LEVEL OF BUSY TONE AMPLIFIER (FIGURE 6)

To set the output level of the busy tone amplifier:

(a) Relays TN and INT are blocked non-operated.

(b) Relay PR is blocked operated.

If ringing tone condenser in incoming trunks is 0.04 MF adjust auxiliary control for 2.8 volts rms.

If ringing tone condenser in incoming trunks is 0.02 MF adjust auxiliary control for 5.5 volts rms.

Return circuit to normal.

6. TIMING OF VOICE ALARM AFTER ANNOUNCEMENT FAILURE

Regulation of the potentiometer G will regulate the time, after failure of voice in bringing in the alarm. This feature is provided with "T" option. This time should be set to approximately 1 minute.

To set the alarm time to 1 minute:

(a) Release AUD RLS L key.

(b) Block the (VA) relay nonoperated.

(c) Operate the (ST) relay.

When relay (ST) is operated one should start to time until relay (VA1) operates. This can be done with a stop watch.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

None.

2. FUNCTIONS

2.01 Provides a check for the cut-through pulse from the announcement machine.

2.02 Provides a check for presence of an announcement on the bus.

2.03 Provides means for actuating the office alarm system.

2.04 Provides an adjustable timed interval based on the cycle time of the announcement at the end of which the alarm system is actuated if at least one full announcement cycle has not been completed.

2.05 Provides means for manually releasing the alarm system.

2.06 Provides means for bringing in a minor alarm, resetting this circuit and transferring announcement machines on the failure of the CT pulse.

2.07 Provides means for bringing in a major alarm on the failure of a CT pulse after a minor alarm.

2.08 Provides means for bringing in a major alarm on failure of the pulse to be checked or a voice failure if single channel machine is furnished.

2.09 Provides means for lighting a lamp on a major alarm, minor alarm, when the AL relay is released, or the OS relay operated.

2.10 Provides means for regulating the time, after failure of voice in bringing in the alarm.

3. CONNECTING CIRCUITS

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

3.1 Distributing Circuit - SD-95855-01. (Typical)
Alarm Circuits

3.2 Crossbar No. 1

3.21 Floor Alarm Frame Misc. and Aux. Alarm Ckt. - SD-25047-01.

3.3 Crossbar No. 5

3.31 Alarm Ckt. - SD-25671-01.

3.4 Panel, Battery Cut-Off.

3.41 Floor Alarm Board Misc. and Aux. Alarm Ckt. - SD-21203-01.

3.5 Panel, Ground Cut-Off.

3.51 Misc. Alarm Ckt. - ES-226189.

3.6 Step-by-Step.

3.61 Audible and Visual Alarm Ckt. - SD-96188-01.

3.62 Pilot Lamp Ckt. - ES-30437-01.

3.63 Audible Alarm Ckt. - SD-31435-01.

3.7 Manual.

3.71 Annunciator Ckt. - SD-90202-01.

3.8 Timing Circuits.

3.81 Common Timing Circuit, Step-by-Step - SD-31558-01.

3.82 Misc. Circuit for Misc. Int. Frame No. 1 Crossbar or Panel - SD-21666-01.

3.83 No. 5 Crossbar Timing Circuit - SD-25870-01.

3.9 Trunk Circuit - SD-95862-01, (Typical).

3.10 Application Schematic, Announcement Machines - SD-95254-01, SD-95255-01.

3.11 Alarm Sending Circuit - SD-95417-01.

3.12 Alarm Transfer Ckt. - SD-20736-01, (Typical).

3.13 Amplifier Application Schematic - SD-95257-01.

3.14 Interrupter Circuits

3.141 Misc. Ckt. for Misc. Int. Frame Panel G.C.O. - SD-21667-01.

3.142 Misc. Ckt. for Misc. Int. Frame Panel B.C.O. - SD-21666-01.

3.143 Misc. Int. Fr. Ckt. Crossbar No. 1 - SD-25062-01.

3.144 Int. Ckt. 60 and 120 IPM Crossbar No. 5 - SD-25814-01.

3.145 30, 60 and 120 IPM Int. Ckt. Step-by-Step - SD-31606-01.

SECTION IV - REASONS FOR REISSUE

CHANGES

B. CHANGES IN APPARATUS

	Superseded	Superseded by
B.1	Res. "G", 144E App. Fig. 1 Cap. "G", KS-13917 App. Fig. 1	Pot. "G", KS-13790, App. Fig. 1 Cap. "G", KS-14009, App. Fig. 1
B.2	Added	Res "T", KS-13492-L3 App. Fig. 1.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Option "V" is rated Mfr. Disc. superseded by Option "T" which is added. This provides for adjusting the length of time before an alarm is sounded.

D.2 Option "R" is rated Mfr. Disc. superseded by Option "S" which is added. This provides for lighting a green lamp as a miscellaneous type alarm regardless whether it is a major or a minor type.

D.3 Option "Q" is added to provide additional leads to the alarm circuit.

D.4 Option "N" is rated Mfr. Disc. superseded by Option "M" which is added. This keeps 48V off transistor A on the stagger time of (ST) contact 11.

D.5 The option Index, Circuit Note, Circuit Requirement table, and the App. Figs. are changed to be consistent with the above changes.

D.6 Option "J" is designated and rated Mfr. Disc. and is superseded by Option "K" which is added to provide for current flow of relay V.

D.7 Use of Option "Z" is extended to include single cable pair subcenters.