COMMON SYSTEMS EXTENSION ALARM CIRCUIT FOR RECEIVING ALARM INDICATIONS OVER A SEPARATE CABLE PAIR FROM A DISTANT OFFICE OR P.B.X.

CHANGES

B. CHANGES IN APPARATUS

B.1	Superseded	Superseded By
	(B) 239FM relay "ZA" option Fig. A	(B) 280J relay "ZB" option Fig. A

C. CHANGES IN CIRCUIT REQUIREMENTS OTHER THAN THOSE APPLYING TO ADDED OR REMOVED APPARATUS

C.1 Test note 2 which applied to the operate test of the (B) 239FM relay is removed. It was formerly shown as follows: "A negative sign (-) preceding a current value indicates that this current shall flow in a direction opposite to the direction of the circuit operating current.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The use of the (B) 239FM relay is rated Manufacture Discontinued and is superseded by the 280J relay to provide a polarized relay that has improved adjustment stability.

D.2 Reference to options ZA & ZB is added to ckt. note 103, "options used" table, and at relay (B) of Fig. A.

D.3 The rating of this circuit is changed from A.T.&T.Co. Standard to Mfr. Disc.

D.4 "Replaced by SD-95484-01" is added to the replacement note.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330-VJA-AJB-BZ

TO BE USED AS AN ORIGINAL
BY THE HAMILTON PRINT SHOP

(2)

CIRCUIT DESCRIPTION
SYSTEMS DEVELOPMENT DEPARTMENT

CD-96217-01
Issue 4-D
Dwg. Iss. 8-D

COMMON SYSTEMS
EXTENSION ALARM CIRCUIT
FOR RECEIVING ALARM INDICATIONS
OVER A SEPARATE CABLE PAIR
FROM A DISTANT OFFICE OR P.B.X.

CHANGES

B. CHANGES IN APPARATUS

B.1 Relay Superseded

Code	Option	Desig.	Fig.	Superseded By Code	Option
Y138	B	(B1)	2	Y279	A
U156	U	(S)	2	U1228	P

C. CHANGES IN CIRCUIT REQUIREMENTS OTHER THAN THOSE APPLYING TO ADDED OR REMOVED APPARATUS

C.1 The adjustment for

		Soak	Opr.	Hold	Rel.
Y138 relay B1 was	Test	30.5	22.5	3.4	0.7
	Readj.	30.5	21	3.2	1.0
B390 relay A	Test	39			
	Readj.	39			
B466 relay A	Test	265			
	Readj.	265			
B1042 relay B	Test	19			
	Readj.	19			
U156 relay S	Test		5.6		
	Readj.		5.3		

Test Note 3 did not apply to U156 Relay (S) before Issue 7-D.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Relays were replaced and adjustments changed as indicated above to secure more stable relay adjustments, particularly in regard to release of the relays affected.

All other headings under changes, No Change.

PURPOSE OF CIRCUIT

1.1 This circuit is used in dial system offices to indicate by means of audible and visual signals whenever a trouble condition occurs in a P.B.X or a step-by-step office arranged to extend its alarms.

2. WORKING LIMITS

	Fig. A	Fig. B		Fig. C	Fig. D
2.1 Max.Ext.Ckt. Loop Res. (Ohms)	4330	500	385	1550	1120
Min. Ins. Res. (Ohms)	30000	30000	30000	30000	30000
Max. Earth potential	±24 V.	--	--	±20 V.	--
Voltage Range in this Office	--	45-50V.	40-56V.	--	45-50V.
Voltage Range in Distant Office of P.B.X.	45-50V.	--	--	15V.Min.	--

3. FUNCTIONS

3.1 To indicate by means of lamps when trouble occurs in a P.B.X. or unattended office with extension of alarms, the red lamp indicating Class A troubles and the white lamp Class B troubles.

3.2 To give an audible signal when a trouble occurs in a P.B.X. or unattended office.

3.3 To provide for silencing the audible signal after the class of trouble has been noted.

3.4 To provide a visual and audible indication when the trouble is cleared.

3.5 To prevent the lighting of the lamps and operation of the audible signals in an office which is not always attended, at the time that the office is unattended. In this case the alarms will be extended through the office alarm system to a distant office.

3.6 To provide for extending the alarm indications received from a distant office or P.B.X. into the office alarm system.

3.7 To provide for extending the alarm indications received from the distant P.B.X. or central office to a switchboard in the same building.

3.8 To provide for tandem extension of alarms thru an intermediate office without marking the alarm checking terminal when the intermediate office is unattended.

4. CONNECTING CIRCUITS

4.1 Alarm circuit in a distant central office or P.B.X. arranged to extend its alarms. SD-31835-01

4.2 Audible and visual alarm circuits. SD-96188-01, No. 1 SXS or SD-95075-01 - Toll & 355A SXS.

4.3 Miscellaneous alarm circuit Alarm Control. 355A Office.- SXS - SD-31980-01

4.4 Trunk or line circuit at switchboard for alarms. SD-90450-01

4.5 Aisle pilot circuit. No. 355A, SXS - SD-31970-01

4.6 Audible alarm circuit for floor alarm board Panel Office. SD-21819-01

4.7 Floor alarm frame miscellaneous and auxiliary alarm circuit. Cross Bar Office SD-25047-01

4.8 Alarm checking terminal circuit. SD-31835-01

DESCRIPTION OF OPERATION

5. CLASS A TROUBLE

When a Class A trouble occurs in a P.B.X. or unattended central office the (A) and (B) relays of Fig. A release or the (A) and (B) relays of Figs. B or D operate grounding the "A" and "B" leads to Fig. 2. Ground on the "A" lead of Fig. 2 operates (A1). This (a) opens the circuit for the "B" lead so that ground on the "B" lead at this time

performs no useful function, (b) lights the (Class A) lamp of Fig. 1, (c) supplies ground on the "A" lead to Fig. 7, 8 or over the "A1" to "A5" lead to Fig. 10 and (d) causes the subset of Fig. 5 to ring continuously. After the visual indication is observed the (DA) key of Fig. 1 is operated, operating (AL) of Fig. 2 which locks under control of (A1), silences the subset and removes ground from the "A" lead to Fig. 7, 8 or 10. When the nonlocking key (DA) is released (S) operates and locks. When the Class A trouble is cleared (A) of Fig. A reoperates or (A) of Figs. B or D releases removing ground from the "A" lead to Fig. 2 in turn releasing (A1) in Fig. 2, which releases (AL), lights the supervisory lamp of Fig. 1, extinguishes the (Class A) lamp, and causes the subset of Fig. 5 to ring continuously. When the lighting of the supervisory lamp is observed the (DA) key is operated releasing (S) and restoring the circuit to normal. If a second Class A trouble occurs after the first Class A trouble is cleared but before the (DA) key has been operated to release (S) the new Class A trouble reoperates (A1) again lighting the Class A lamp of Fig. 1 and continuing the operation of the subset since the (AL) relay is released and extinguishes the supervisory lamp of Fig. 1. The audible signal is retired the same as described above for the original Class A trouble. This same indication of a second Class A trouble following the first Class A trouble is simulated where Class A troubles are subdivided in the distant office by momentarily interrupting the Class A indication when a more important trouble follows another Class A trouble. The sub-classes of the Class A trouble are indicated by audible signals which can be heard by dialing an alarm checking terminal in the unattended office.

6. CLASS B TROUBLE

When a Class B trouble occurs in the distant unattended office or P.B.X. (B) of Fig. A releases or (B) of Figs. B, C, or D operates connecting ground over the "B" lead to Fig. 2. This operates (B1) which lights the (Class B) lamp of Fig. 1, causes the subset of Fig. 5 to ring continuously and where "X" or "T" wiring is used supplies ground on lead "A" to Fig. 7, "B" to Fig. 8 or "B1" to "B5" to Fig. 10. As described above the audible signal can be retired by the momentary operation of the (DA) key which causes (BL) to operate and lock upon the operation of the key and (S) to operate and lock upon the release of the key. When the Class B trouble is cleared the subset of Fig. 5 again rings continuously, the (Class B) lamp is extinguished, and the white supervisory lamp of Fig. 1 is lighted since (B1) of Fig. 2 releases, in turn releasing (BL). As described above the operation of (DA) causes the retirement of the supervisory lamp and silencing of the subset. If a second Class B alarm occurs before the clearing of the first Class B trouble is observed (B1) again operates lighting the (Class B) lamp of Fig. 1 and continues the operation of the subset in Fig. 5. The audible indication can be retired as on the first Class B trouble.

7. CLASS B TROUBLE OCCURS AFTER A CLASS A TROUBLE

When both a Class A and Class B trouble condition exists in an unattended office or P.B.X. the Class B trouble is ignored and cancelled as described above by opening the circuit from the "B" lead to Fig. 2 preventing the operation of (B1). However, in this case when the Class A trouble is cleared and the Class B trouble still in, (B1) operates upon the release of (A1) causing the (Class B) lamp to light and the subset of Fig. 5 to sound continuously. The audible signal in this case is retired the same as on the original Class B trouble described above.

8. CLASS A TROUBLE OCCURS AFTER A CLASS B TROUBLE

When a Class A trouble occurs with a Class B trouble already in, (A1) of Fig. 2 operates as described above releasing (B1) and (BL) if operated, (B1) released, retires the (Class B) lamp and (A1) operated, lights the (Class A) lamp and causes the subset of Fig. 5 to operate continuously. (B1) is slow in releasing thus removing the ground supply to the "A" lead to Fig. 7 for a moment when a Class A trouble occurs. The audible indication of the Class A trouble can be retired as described above.

9. CLASS A AND CLASS B TROUBLE EXTENDED TO OFFICE ALARM SYSTEM

When the area at which the lamp cabinet is located is sometimes uncovered but is located in an office with a maintenance man who is required to cover the alarm indications from the distant offices and P.B.X.'s the alarms are transferred to the office alarm system by the operation of the (TRNS) key of Fig. 3. In this case when a Class A trouble occurs (A1) of Fig. 2 operates as before causing the lighting of the lamps and ringing the subset through the operation of (AX) of Fig. 4. (AX) also lights the red aisle pilots and causes the sounding of the tone bar alarm or its equivalent in panel or crossbar offices or the

vibrating bell in step-by-step offices. If the P.B.X. cabinet is not located in an area covered by aisle pilots Fig. 6 is provided in the nearest area covered by aisle pilots so as to direct the maintenance man to the cabinet. Similarly if a Class B trouble occurs (BX) of Fig. 4 operates causing the subset of Fig. 5 to sound and where "Y" wiring is used, causing a permanent signal indication to be given through the operation of the buzzer in the nearest switchroom and the lighting of the white aisle pilots. Where "W" wiring is used, the minor audible alarm or its equivalent is sounded and the green aisle pilots are lighted. As in the case of the Class A trouble if the cabinet is not located in an area covered by aisle pilots Fig. 6 is provided in the nearest location to direct the maintenance man to the cabinet.

10. ALARMS EXTENDED TO THE SWITCHBOARD

10.1 By Use of Key (SWB) - Fig. 7 or 8

When there is a switchboard located in the building and at times there is no maintenance man present the key of Fig. 7 or 8 is operated extending the ground indication previously referred to to a trunk or line circuit which when ground is received causes the lighting of the line lamp at the switchboard. This lamp is retired by the insertion of an answering cord in jack. When the alarm condition is cleared the ground is removed. The operator may dial back the alarm checking terminal in the distant office to identify the exact class of the trouble and report the trouble to the responsible man of the maintenance force who also may verify the class of trouble by dialing the same alarm checking terminal.

10.2 Automatic Extension by Use of Fig. 10.

While the office is attended, ground is received from the Office Alarm Circuit over lead "BG", holding relay (SB) operated. This holds open the A1 to A5 and B1 to B5 leads, preventing the appearance of alarms at the switchboard. However, leads AA and BB are closed to cause operation of the subset of Fig. 5, or of the (AX) or (BX) relays of Fig. 4 whenever a Class A or B trouble occurs. When the office is unattended, relay (SB) releases, permitting transmission of the Class A or B trouble indication to the switchboard, and preventing such transmission thru relays AX and BX to the office alarm circuit and alarm checking circuit, which later would also bring in another Class A or B lamp indication at the switchboard, thus causing doubt as to whether one or two troubles exist.

11. EXTENSION OF ALARM INDICATION TO A DISTANT OFFICE - NO TANDEM EXTENSION OF ALARMS

If the office in which this cabinet is located is at times unattended the alarm indications may be extended to a distant office through the use of Figs. 4 and 9. When Figs. 3 and 4 are used, the transfer of Class A and Class B alarms to the regular office alarm circuit will cause marking of the alarm checking terminal and extension of the alarm to the master office. At the time that the office is unattended the grounds for lighting the lamps and ringing the subset are removed saving current drain and preventing unnecessary noise.

12. TANDEM EXTENSION OF ALARMS TO A DISTANT OFFICE

When Fig. 9 is used, relay (TX) normally operated connects Fig. 2 to Fig. 3, 4 or 5 when alarms are not silenced and the operation of the circuit is as described in Sections 5 to 11. When alarms are silenced, ground is removed from lead "BG" releasing relay (TX) and also relays (AL) and (BL) if these relays have been operated to silence an alarm. The release of relay (TX) also releases relay (S) if operated, places direct ground on lead "G" to Fig. 2 and transfers leads A and B of certain Figs. 2 to the alarm checking circuit or alarm sender over leads "AA" and "AB" where grounds from these leads will extend class A and class B alarms without marking the checking terminal. The "A" and "B" leads are transferred in this manner from those Figs. 2 associated with outlying offices having alarm checking terminals.

Alarms from offices not having alarm checking terminals will be transmitted thru other Figs. 2 and Fig. 9, and with key of Fig. 3 operated, to Fig. 4, and thence thru the audible alarm checking circuit as described in Sections 3 to 11.