

STATION SYSTEMS  
KEY TELEPHONE SYSTEM NO. 2B  
FOR 2-STATION INTERCOMMUNICATING SERVICE  
ARRANGED FOR A LOUDSPEAKER  
AND DISTANT TALKING TRANSMITTER  
AT ONE STATION

Drawings for SD-69204-01 have been converted from 4- by 7-inch handbook size to 8-1/2 by 11-inch handbook size. This CD will no longer be printed in 4- by 7-inch handbook size.

Appendix 1A should refer to Issue 2D instead of Issue 3D.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5113-WFBW-LHA

STATION SYSTEMS  
KEY TELEPHONE SYSTEM NO. 2B  
FOR 2-STATION INTERCOMMUNICATING SERVICE  
ARRANGED FOR A LOUDSPEAKER  
AND DISTANT TALKING TRANSMITTER  
AT ONE STATION

0. CHANGES

0.1 CHANGED AND ADDED FUNCTIONS

None.

0.2 CHANGES IN APPARATUS

<u>Apparatus</u>	<u>Removed</u>	<u>Replaced by</u>
Subscriber Set	531A	687A
Cord	D10D-9	D10G-3

0.3 CHANGES IN CIRCUIT REQUIREMENTS  
(Not Associated with 0.2 Above)

None.

0.4 DESCRIPTION OF CIRCUIT CHANGES

- (a) Fig. 8 is added to show 687A subscriber set which supersedes 531A subscriber set of Fig. 7 now rated Mfr Disc.
- (b) The circuit diagram of the 500L or M telephone set is added as Fig. 9.
- (c) Notes 110 and 201 are added.
- (d) Fig. 1 is changed to show D10G-3 cord connected to 330A telephone set.
- (e) Minor changes are made in Fig. 1, 2, 3, 4, 6, and 7.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5113-JIG-LHA

STATION SYSTEMS  
KEY TELEPHONE SYSTEM NO. 2B  
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AND DISTANT TALKING TRANSMITTER  
AT ONE STATION

CHANGES

B. CHANGES IN APPARATUS

Superseded	Superseded by
U6107 Relay	UA129 Relay

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The UA129 Relay supersedes the U6107 relay as shown in the circuit requirements table. The use of the U6107 relay is Mfr. Disc.

D.2 Figures 2 and 3 are changed and figure 7 is added to show the use of the 500 L & M telephone sets to eliminate the need for a separate ringer.

D.3 Note 109, record of changes, is added.

All other headings under Changes, no change.

1. PURPOSE OF CIRCUIT

1.1 This circuit provides means for communication between a master station equipped with a loud speaker and a distant talking transmitter and a secondary station equipped with a standard telephone set. It also provides for the master station to communicate with the secondary station by means of a standard telephone set normally used for regular telephone service. Both stations may also employ the telephone set for regular telephone service.

2. WORKING LIMITS

2.1 Maximum conductor loop resistance for the (S1) relay - 60 ohms.

2.2 Maximum conductor loop resistance for the buzzers - 60 ohms. When 2 or more buzzers are multiplied divide the 60 ohms by the number of buzzers connected in multiple. Maximum number of secondary station buzzers with "Y" wiring -3.

3. FUNCTIONS

3.01 The master station signals the secondary station by means of a buzzer.

3.02 The secondary station signals the master station by means of a buzzer or voice.

3.03 The master station talks to the secondary station by means of the distant talking

transmitter and hears the secondary station by means of the loudspeaker.

3.04 The master station communicates with the secondary station, both employing a standard telephone set on the intercommunicating line.

3.05 The master and secondary stations employ a standard telephone set on a central office or P.B.X. telephone line.

3.06 Provides a switch to connect and disconnect commercial power from the amplifiers that supply the distant talking feature and loud speaker reception.

3.07 Provides a knob for controlling the loud speaker volume.

3.08 Provides a switch (D2) to silence the set ("OFF" position) activate the set ("TALK" position) or signal the secondary stations ("SIGNAL" position).

3.09 When the master station uses hand set on the intercommunicating line the hand set transmitter obtains battery supply under control of (MT) key and hand set mounting contacts and irrespective of position of (D2) switch.

3.10 When the master station uses hand set on intercommunicating line the loud speaker and distant talking transmitter are made inoperative.

3.11 Provides pilot lamp that lights when secondary station hand set is removed from mountings, (D2) switch is in "TALK" position and (MT) key, if provided, is in the normal position.

3.12 Provides means for connecting the circuit so that voice signaling may be used from the secondary to the master station even when the (D2) switch is in the "OFF" position.

4. CONNECTING CIRCUITS

4.1 Standard Central Office Subscriber's Line Circuits

4.2 Standard Individual Line Subscriber Sets or Telephone Sets

4.3 Standard P.B.X. Station Line Circuit

4.4 Standard Key Telephone Sets Arranged to Pick Up Two or More Lines With Signaling on One Signaling Circuit

## DESCRIPTION OF OPERATION

## 5. CONNECTION OF SET TO COMMERCIAL POWER

After plugging the set into a commercial power outlet the following test should be made to determine if the connection is poled properly. This test should be made with the master station transfer key in the normal (straight out) position and the secondary station handset off the switchhook and connected to the intercommunicating line.

- (a) If the power is alternating current, reverse the plug in the outlet and determine the position at which there is a minimum hum in the secondary station.

Note: This test can usually be made without using the secondary station by connecting a lineman's handset or test set across terminal 9 and 2 of the connecting block with the talk switch or button operated and determining the position of minimum hum in the test set receiver.

- (b) If the power is direct current make a talking test. If it is not possible to hear conversation at either station reverse the plug in the outlet.

Note: This test can also be made without using the secondary station by connecting a lineman's handset or test set across the terminals 9 and 2 of the connecting block with the talk switch or button operated and blowing into the test set transmitter. If the blowing sound is transmitted to the loudspeaker or if a singing condition occurs the poling is correct.

## 6. ORIGINATING CALL AT MASTER STATION EMPLOYING LOUDSPEAKER

The master station having operated the (D1) switch to energize the amplifiers, operates the (D2) switch to the (SIGNAL) position operating the buzzer at the secondary station. Since the (D2) switch is non-locking in the (SIGNAL) position it returns automatically to the (TALK) position. The secondary station user in answer to the buzzer signal, with the (ST) key normal, removes the hand set from the mounting causing current to flow over the intercommunicating line energizing the (S1) relay. The (S1) relay operated removes the short circuit across the distant talking transmitter, closes the circuit to the loud speaker and lights the (LP1) pilot lamp. Talking battery for the secondary station is supplied through the (S1) relay and incoming speech from the secondary station is amplified through the V1 tube to supply the loud speaker. Outgoing speech is picked up by the distant talking transmitter, amplified through the V2 tube and transmitted through the T3 induction coil to the intercommunicating line. This provides a two-way conversation over the intercommunicating line. Upon completion of conversation the (D2) switch at the master station is restored to the (OFF) position and the secondary station handset is

replaced on its mounting. When this occurs the (S1) relay releases, short circuiting the distant talking transmitter, opening the circuit, to the loud speaker and extinguishing the (LP1) lamp.

## 7. ORIGINATING CALL AT MASTER STATION EMPLOYING HAND SET

When the master station desires to employ the hand telephone on the intercommunicating line, the (MT) key is operated removing the hand set from the telephone line and associating it with the intercommunicating line. The operation of the (MT) key also transfers the intercommunicating line from the (T3) induction coil and (S1) relay to the (L2) retard coil. Operating the (D2) switch to the (SIGNAL) position causes the buzzer to operate at the secondary station. The hand set at the secondary station is removed from the mounting with the (ST) key normal. With the hand set at the master station also removed from its mounting both stations receive talking battery through the (L2) retard coil and a conversation is provided over the intercommunicating line. When conversation has been completed, the hand sets at both ends of the connection are restored to their mountings and the (MT) key is restored to normal.

If (MT) key is not restored at this time and a subsequent call is made from the master station with an intent to use the microphone and loud speaker there will be no signal when the secondary station answers and it will be necessary for the secondary station user to signal back with his signaling key to indicate that the (MT) key should be restored.

## 8. SECONDARY STATION ORIGINATES CALL TO THE MASTER STATION

- 8.1 Strap "A" between terminals 11 and 12 (not permitting secondary station to call on loud speaker)

With the Strap "A" between terminals 11 and 12, it is necessary for the secondary station to signal the master station by means of the buzzer signal. The buzzer at the master station is operated by operating the (ST) key of Fig. 3 to the non-locking position or by means of the push button, if Fig. 4 is provided or by means of the signaling key in the key telephone set if Fig. 5 is used. The master station responds to the buzzer signal by operating the (D2) switch to the (TALK) position. This closes the circuit to the (S1) relay providing talking battery to the secondary station and operating the (S1) relay. The (S1) relay operated removes the short circuit from the distant talking transmitter, closes the circuit to the loud speaker and lights the (LP1) lamp. Upon completion of conversation the master station restores the (D2) switch to the (OFF) position and the secondary station restores the handset to the mounting, releasing the (S1) relay. The (S1) relay released short circuits the distant talking transmitter, opens the circuit of the loudspeaker and extinguishes the (LP1) lamp. The master station may also use his handset as described in paragraph 7.

8.2 Strap "A" between terminals 10 and 11 (permitting secondary station to call on loud-speaker)

With strap "A" between terminals 10 and 11 the secondary station may remove the handset from its mounting and call to the master station by means of a voice signal. The master station responds to this signal and conversation is completed as described in paragraph 8.1.

8.3 Strap "A" when connected between terminals 10 and 11 insures the use of a voice signal to call the master station only when no facility is provided for the master station to employ the handset on the intercommunicating line. If the (MT) key is left operated by the master station it would be impossible for the secondary station to call the master station over the loudspeaker.

## 9. MULTIPLE CONNECTIONS

Two or more secondary stations may be multiplied to the same intercommunicating line. If more than one secondary station is connected at a time with the master station when the latter employs the loudspeaker and distant talking transmitter, or more than three secondary stations when the master station employs a hand telephone on the intercommunicating line transmission may not be satisfactory.

## 10. MASTER STATION EMPLOYS HAND TELEPHONE ON TELEPHONE LINE

The telephone set at the master station is normally associated with the telephone line through

the contacts of the (MT) key. With the (MT) key normal, the telephone set operates in the usual manner. When the (MT) key is operated, the ringer remains associated with the telephone line but the transmission circuit is transferred to the intercommunicating line.

## 11. SECONDARY STATION EMPLOYS HAND TELEPHONE ON TELEPHONE LINE

With Fig. 3 the telephone set at the secondary station is normally associated with the intercommunicating line. In order to associate it with a telephone line the (ST) key must be operated. When this occurs, the telephone operates in the usual manner. The ringer at the secondary station is always associated with the regular telephone line. With Fig. 5 the telephone set may be associated with a telephone line by operating the proper key in the key telephone set.

## 12. VOLUME ADJUSTMENT

The volume of reception over the loudspeaker can be adjusted by means of the volume control knob to suit the customer.

## 13. BUZZER ADJUSTMENT

An adjusting screw on the side of the buzzer provides an adjustment for changing the tone.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 4130-JIG-HTC