

STATION SYSTEMS
KEY AND TELEPHONE CIRCUIT
FOR 2- AND 4- WIRE LINES
568HB SETSECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

This circuit provides station talking and dialing circuits together with pickup keys for connecting to a maximum of five lines. The lines may be 2- or 4-wire common battery dial central office or PBX lines, 2- or 4-wire private lines, or 2-wire intercommunicating lines. It also provides for holding one or more lines, signal lamps which illuminate the pickup key buttons, a ringer which may be associated with one of the lines, or a ringer or buzzer which may be used as a common signal, signal keys, a common signal key to signal private or intercommunicating lines, and an exclusion key.

SECTION II - DETAILED DESCRIPTION

1. DESCRIPTION OF OPERATION

1.1 Transmitting and Receiving

1.1.1 On 2-Wire Lines

The handset and network circuit function in the usual manner as a common battery subscriber station circuit.

1.1.2 On 4-Wire Lines

Operation of the 4-wire (FW) relay of Fig. 1 disconnects the receiver from the network and connects the receiver to the "RT" and "RR" leads. The transmitter and network function in the usual manner as a common battery transmitter circuit. The receiver leads are externally switched to impedance-matching repeating coils in the associated line circuits.

1.2 Line Selection

1.2.1 General

The pickup keys, which are locking type and are arranged to release other pickup keys when operated, have three make contacts on each key and are mechanically interlinked so that an operated pickup key is forced by the operation of another pickup key to break its contacts before the second key makes its contacts.

1.2.2 2-Wire Lines

When a pickup key is operated, the common circuits are connected to the line associated with that key, and a call may be answered or originated in the usual manner.

1.2.3 4-Wire Lines

When a pickup key is operated, the transmitting portion of the circuit is connected to the line associated with that key. The "A" lead ground operates an external pickup relay associated with the line, which in turn supplies battery to operate the FW relay of Fig. 1 and also connects the receiving leads "RT" and "RR" to the associated line circuit.

1.3 Signaling

1.3.1 Visual Signals

Signal lamps are provided to illuminate the pickup key buttons and are operated by the associated line circuits which provide different signals by lighting the lamps steadily or with various interruptions.

1.3.2 Audible Signals

A ringer and capacitor are provided in the set and may be used as either a line ringer or a common ringer. If the ringer and capacitor are used as a line ringer, they will operate on all incoming calls on the line with which the ringer is associated when ringing current is applied to the line at the central office or the PBX. If they are used as a common ringer, they will operate when ringing current is applied to any line with which the common ringer is associated. Ringer connections to provide a line ringer on a 2-wire line are available within the set. When providing a line ringer on a 4-wire line or when providing a common ringer, the "R or R1" and "B or B1" leads are used to connect the ringer externally.

A KS-8109 buzzer may be used as a common signal or as an intercommunicating signal, if desired. Mounting space is provided on the ringer bracket within the set.

1.3.3 Convertible Keys

The three farthest-right keys provided can be converted from pickup to signaling or vice versa. Line transfer and auxiliary transfer functions may also be assigned to these keys when the Auxiliary Service Transfer Circuit for 4-Wire Lines is furnished. The keys are converted from locking to nonlocking by removing a screw detail from the plunger. The circuit is converted for signaling by moving a flexible lead to a ground supply terminal. The key contact and cord conductor, which in the pickup condition connect to the "A" lead, are used for the signaling lead.

1.3.4 Common Signaling Key

The set can be arranged for signaling on 2- or 4-wire private lines or 2-wire intercommunicating lines by means of a common signaling key. With these lines the auxiliary control lead is not required and is used as a signaling lead by operating a signaling key while the pickup key is operated.

1.3.5 Dial

A dial is provided in the set to operate the machine-switching central office or PBX lines, or dial selective intercommunicating line circuits. The dial is operated in the usual manner. Priority and special grade signals on 4-wire lines are transmitted by dialing a prefix code. Dial pulses on 4-wire lines are sent out over the transmitting pair. The off-normal contacts of the dial provide a closure to the 4-wire line circuit where a relay removes all capacitive bridges from the transmitting path during pulsing, thus preventing distortion of the pulses. Operation on 4-wire private lines with selective signaling is provided by relaying dial pulses from the battery feed relay in the associated 4-wire private line circuit. Connections are shown for the KS-16844 Rapidial for automatic dialing ("Y" option).

1.3.6 Set Switch

The set switch is provided with three sets of contacts. The continuity transfer contact is used for the auxiliary control lead. The closure contact completes the ring side of the line or the ring side of the transmitting pair. The normally closed contact shunts the receiver when the handset is replaced on the cradle.

1.4 Holding

A hold key is provided for use with line circuits providing the holding feature. Operation of the hold key opens the "A" lead, which permits a hold relay in the line

circuit to operate in series with the transmitter circuit and to lock operated. Release of the hold key restores the pickup key through mechanical linkage. When the line is again picked up, the "A" lead is closed causing the hold relay to be short circuited and to restore, thereby releasing the holding bridge.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

Maximum connector cable resistance per conductor:

Lamp "L" leads - 25 ohms.

4-wire relay "FW" lead - 50 ohms.

2. FUNCTIONAL DESIGNATIONS

None.

3. FUNCTIONS

This circuit provides for:

- (a) A handset and anti-sidetone transmission circuit for connection to 2-wire common battery lines.
- (b) A relay to switch the transmission circuit to permit connection through an external circuit to a 4-wire common battery or local battery line.
- (c) Picking up a maximum of five lines.
- (d) Operation of holding circuits.
- (e) An audible signal device which may be connected to any one line or to an external circuit.
- (f) Dialing.
- (g) A common signal key to signal two or three private lines.
- (h) Keys that may be converted in the field from pickup (locking) to signaling (nonlocking).
- (i) Lamps to indicate visual signals.
- (j) A mounting cord terminating in a plug.
- (k) An exclusion key, which may be operated when the handset is off the mounting, to disconnect one or more extension stations from a given line. The exclusion key will be restored to normal when the handset is replaced on the mounting.
- (l) Signaling keys arranged to operate local circuits.

- (m) Facilities for a lamp in the first key position.
- (n) Operation with 2- and 4-wire speakerphone.
- (o) Operation with

4. CONNECTING CIRCUITS

When this circuit is listed on a key-sheet, the connecting information thereon is to be followed. The following are typical connecting circuits:

- (a) 4-Wire Subscriber Line Circuits Arranged for Common Battery Operation - SD-69414-01.
- (b) Auxiliary Service Transfer Circuit for 4-Wire Lines - SD-69422-01.
- (c) Key Telephone System No. 1A1 - Visual and Audible Signal Circuit - SD-69294-01.
- (d) Key Telephone System No. 1A1 - CO or PBX Line Circuit - SD-69270-01.
- (e) Key Telephone System No. 1A1 - Line and Signaling Circuit - SD-69203-01.
- (f) Station Connector Cables and Associated Components - SD-69368-01.
- (g) 4-Wire Key Telephone System Arranged to Terminate 2- and 4-Wire No. 5 Crossbar Central Office Lines - Block Diagram - SD-69424-01.
- (h) 4-Wire Private Line Circuit - SD-69410-01.
- (i) 4-Wire Private Line Circuit - SD-69449-01.
- (j) 4-Wire Subscriber Line Circuit - SD-69488-01.
- (k) Auxiliary Service Transfer Circuit for 4-Wire Lines - SD-69491-01.
- (l) Speakerphone System No. 3A, Telephone and Speakerphone Circuit - SD-69403-01.

- (m) Speakerphone Control Circuit for 2- and 4-Wire Lines - SD-69487-01.
- (n) KS-16844 Rapidial.

SECTION IV - REASONS FOR REISSUE

A. CHANGED AND ADDED FUNCTIONS

- A.1 A buzzer mounting arrangement is added.
- A.2 Speakerphone operation is added.
- A.3 Rapidial operation is added.

B. CHANGES IN APPARATUS

B.1 Superseded

Ringer, C4A, Fig. 1.
Relay FW, KHX-213, Fig. 1.

Superseded By

Ringer, H1A, Fig. 1.
Relay, FW, KHX-298 (KS-19132, List 1),
Fig. 1.

D. DESCRIPTION OF CHANGES

- D.1 The ringer is changed from C4A to H1A in Fig. 1.
- D.2 The FW relay is changed from KHX-213 to KHX-298 (KS-19132, List 1) in Fig. 1.
- D.3 Speakerphone connections are added in Fig. 1.
- D.4 Rapidial connections are added in Fig. 1.
- D.5 Buzzer connections are added in Fig. 1.
- D.6 Circuit Note 109 is added.
- D.7 Equipment Note 201 is added.

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DEPT 5333-WJM-PBF