

**BELL SYSTEM PRACTICES**  
**Station Installation and Maintenance**

**SECTION C53.251**  
**Issue 2, 7-2-37**  
**AT&T Co. Standard**

## **15A AND 23A KEY EQUIPMENTS**

### **DESCRIPTION**

#### **1. GENERAL**

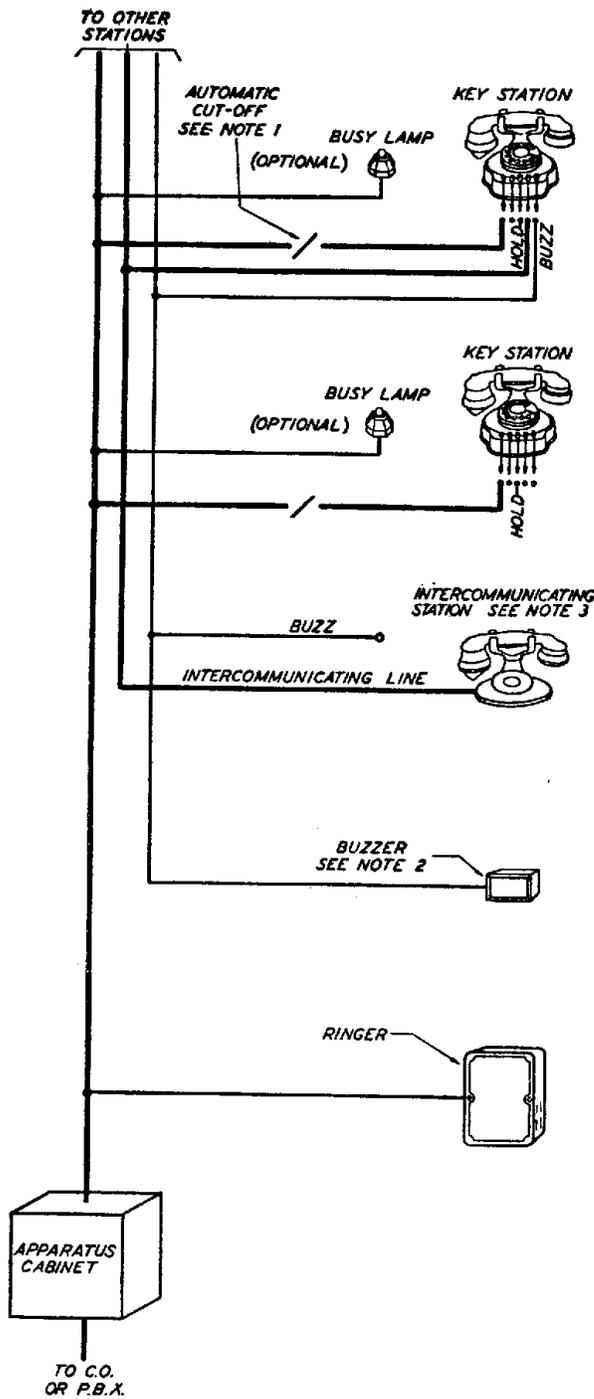
1.01 15A and 23A key equipments are used for business or residence service on subscribers' premises for stations sharing the use of one or two central office or P.B.X. lines and an intercommunicating circuit and requiring automatic cutoff and holding on line connections. Control keys are provided either in hand telephone sets or separately.

1.02 The 15A key equipment is arranged for one and the 23A key equipment for two central office or P.B.X. lines.

1.03 Either key equipment may have from two to eleven stations equipped with control keys which are known as key stations and, if required, one or more stations connected to the intercommunicating circuit only which are known as intercommunicating stations.

1.04 The general features of the two equipments are indicated on Figs. 1 and 2.

1.05 This section is reissued to cover changes in apparatus ←  
and power cabinet assemblies.

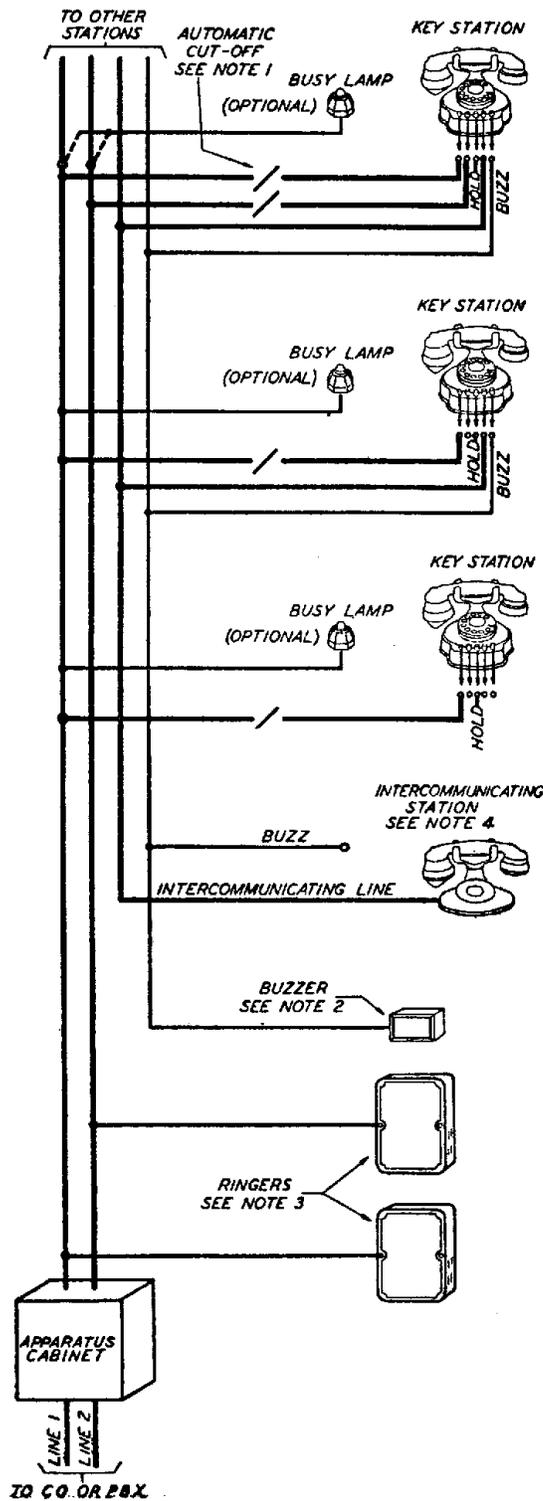


MAXIMUM NUMBER OF KEY STATIONS 11  
 MAXIMUM NUMBER OF RINGERS 4

NOTES.

1. (A) AUTOMATIC CUT-OFF IS PROVIDED ON C.O. OR P.B.X. LINE BUT NOT ON INTERCOMMUNICATING LINE.  
 (B) AS SHOWN, EACH STATION CUTS OFF ALL OTHER STATIONS.  
 (C) ANY STATION MAY BE ARRANGED NOT TO CUT OFF OTHER STATIONS.  
 (D) A MAXIMUM OF 5 STATIONS MAY BE ARRANGED SO THAT THE STATIONS DO NOT CUT OFF EACH OTHER, BUT WILL CUT OFF ALL OTHER STATIONS.
2. BUZZER SIGNALING:  
 (A) CODE-ONE BUTTON IS FURNISHED AT EACH STATION, AS SHOWN, WHICH OPERATES ALL BUZZERS SIMULTANEOUSLY.  
 (B) INDIVIDUAL WHEN DESIRED ONE OR MORE BUTTONS ARE FURNISHED AT EACH STATION. EACH BUTTON OPERATES ONLY THE BUZZER AT THE DESIRED STATION.  
 (C) A COMBINATION OF (A) AND (B) CAN BE FURNISHED. NO ADDITIONAL BUZZERS ARE REQUIRED WHEN SUCH A COMBINATION IS EMPLOYED.
3. INTERCOMMUNICATING STATIONS NEED NOT BE PROVIDED.

Fig. 1-15A Key Equipment—Feature Diagram.



MAXIMUM NUMBER OF KEY STATIONS 11  
 MAXIMUM NUMBER OF RINGERS PER LINE 4

**NOTES:**

1. (A) AUTOMATIC CUT-OFF IS PROVIDED ON CO. OR PB.X. LINES BUT NOT ON INTERCOMMUNICATING LINE.  
 (B) AS SHOWN, EACH STATION CUTS OFF ALL OTHER STATIONS.  
 (C) ANY STATION MAY BE ARRANGED NOT TO CUT OFF OTHER STATIONS.  
 (D) A MAXIMUM OF 5 STATIONS MAY BE ARRANGED SO THAT THE STATIONS DO NOT CUT OFF EACH OTHER, BUT WILL CUT OFF ALL OTHER STATIONS.
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 (B) INDIVIDUAL- WHEN DESIRED ONE OR MORE BUTTONS ARE FURNISHED AT EACH STATION. EACH BUTTON OPERATES ONLY THE BUZZER AT THE DESIRED STATION.  
 (C) A COMBINATION OF (A) AND (B) CAN BE FURNISHED. NO ADDITIONAL BUZZERS ARE REQUIRED WHEN SUCH A COMBINATION IS EMPLOYED.
3. WHERE DISTINCTIVE RINGING SIGNALS ARE REQUIRED USE GONGS WITH DIFFERENT TONES.
4. INTERCOMMUNICATING STATIONS NEED NOT BE PROVIDED.

**Fig. 2—23A Key Equipment—Feature Diagram.**

## 2. OPERATING FEATURES

### **P.B.X. and Central Office Line Signals**

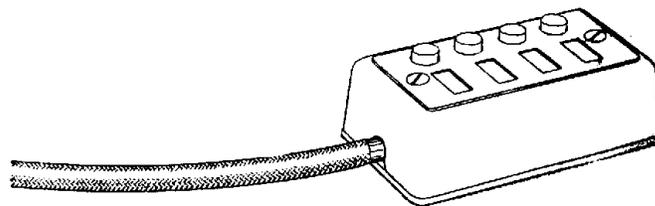
2.01 Incoming signals on the central office or P.B.X. lines are obtained from one to four standard extension ringers per line, located as required.

### **Signals for Local Line**

2.02 Signals for the intercommunicating circuit may be obtained either from buzzers or from bells. Separately mounted buzzers and also buzzers mounted in place of ringers in subscriber sets are available. However, no wall sets containing buzzers are available. The 7-type buzzers and bells recommended for these key equipments will operate on either 15-26 volt d.c. or nominal 18-volt 60-cycle a.c., such as from a power unit J86205A. Prior to the availability of 7-type buzzers and bells, 4-type buzzers, either separately or in 634-BH subscriber sets, were provided, and operated from d.c. only.

### **Signaling (Code and Individual) on Local Line**

2.03 Each key station is regularly equipped with one buzzer key for signaling on the local line. If more buzzer keys are required, a separate 549 type buzzer key (Fig. 3), having four buttons with associated designation windows, may be provided. Of the five buttons thus provided, any may be used for either code or individual signaling.



**Fig. 3—Buzzer Key.**

### **Automatic Cut-Off**

2.04 Lifting the receiver or hand set and depression of the No. 1 or No. 2 push button at a key station connects the telephone set to the central office or P.B.X. line and, by means of the automatic cut-off circuit, prevents subsequent connection of all or certain other stations to the same line until the receiver or hand set has been restored or the line key released at the first station. At any key station, if desired, a busy lamp indicator may be provided. At stations so equipped the lamp signal operates if connection is attempted to a line already in use at another station which is arranged to cut off

the station having the busy lamp. For secretarial purposes a busy lamp associated with each central office or P.B.X. line and arranged to light whenever the associated line is in use may also be provided.

### **Holding**

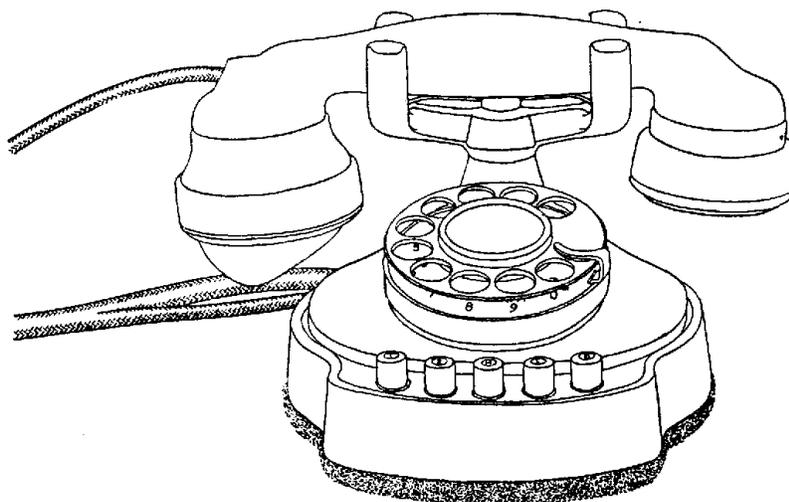
2.05 At each key station a line may be held by operation of a non-locking push button holding key so that the connection will not be released at the central office or P.B.X. until a second connection has been made to the line by the same or another key station. This permits using the telephone set for answering or placing a call on another line or for calling on the intercommunicating circuit when the connection is to be transferred to another key station.

### **Emergency Key**

2.06 At one key station, if desired, a key may be provided for emergency use in calling the central office on one of the lines in event of power supply failure.

## **3. EQUIPMENT FEATURES**

3.01 At key stations with hand telephone sets, five control keys are mounted in the base of the hand set mounting, as illustrated in Fig. 4, and consist of line keys 1 and 2, the holding key, the intercommunicating key and the buzzer key in the order named from left to right. The same hand telephone set is used with both the 15A and the 23A key equipments. For use with the 15A key equipment the unused line key may be permanently locked to prevent its operation.



**Fig. 4—Key Station Hand Telephone Set.**

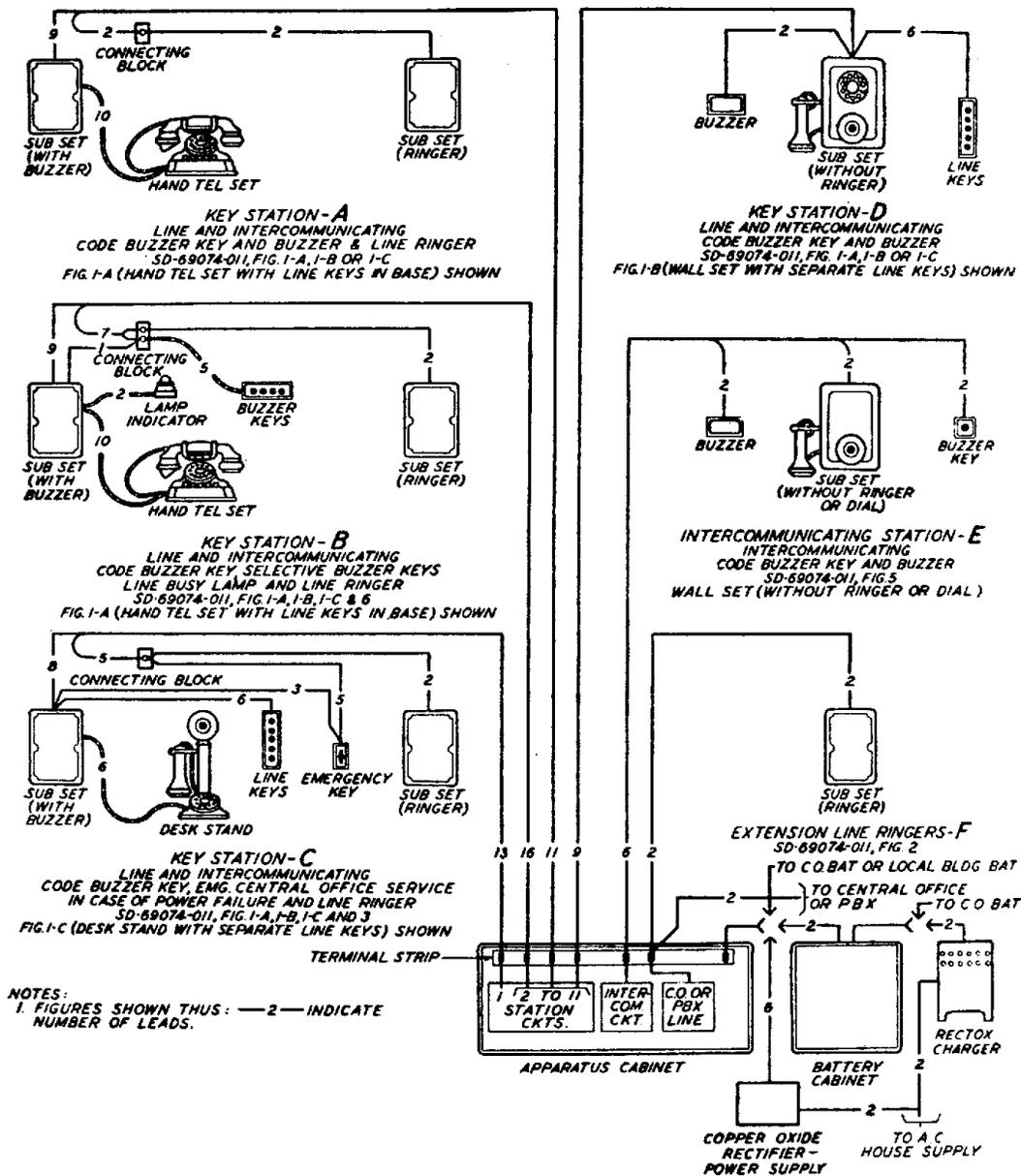
3.02 At key stations having separately mounted control keys the key buttons are grouped in the same order except that where mounted vertically the line keys are at the top and the buzzer key at the bottom. For use with the 15A key equipment the unused line key may be permanently locked to prevent its operation.

3.03 The same apparatus cabinet including a local cable with relay equipment as required is used for both key equipments.

3.04 Standard 11-plate metal apparatus cabinets are used but they are equipped as assembled units including relay equipment on 14-1/8" mounting plates and local wiring. The cabinet for the 15A key equipment is equipped for 4 stations and that for the 23A key equipment is equipped for 6 stations. They are wired for a capacity of eleven key stations for central office, P.B.X. and intercommunicating service, two central office or P.B.X. lines, one intercommunicating line, one code buzzer circuit, one emergency key and the automatic cut-off circuit for either key equipment. Terminals are provided for connecting the intercommunicating stations to the intercommunicating line. Earlier type wood apparatus cabinets in which the equipment arrangements are similar to those in the metal cabinet may also be used. ←

3.05 Typical station equipment groupings and conductor requirements for the key equipments are illustrated on Figs. 5 and 6, respectively.

**ONE LINE-REMOTE CONTROL-AUTOMATIC CUT OFF  
INTERCOMMUNICATING-TYPICAL STATION EQUIPMENT GROUPING  
AND CONDUCTOR REQUIREMENTS**



**Fig. 5—15A Key Equipment.**

TWO LINE-REMOTE CONTROL-AUTOMATIC CUT OFF-  
INTERCOMMUNICATING-TYPICAL STATION EQUIPMENT GROUPING  
AND CONDUCTOR REQUIREMENTS

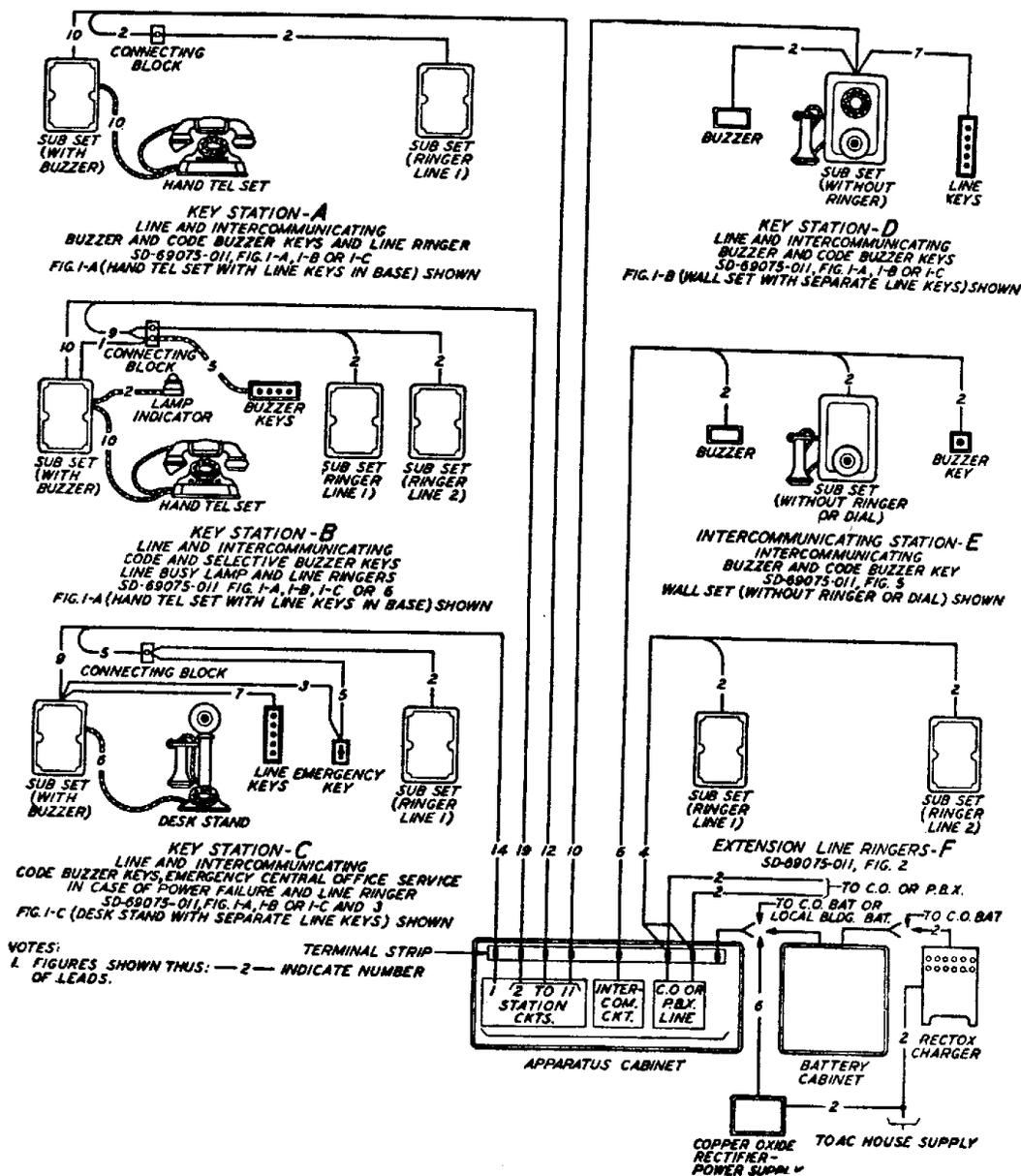
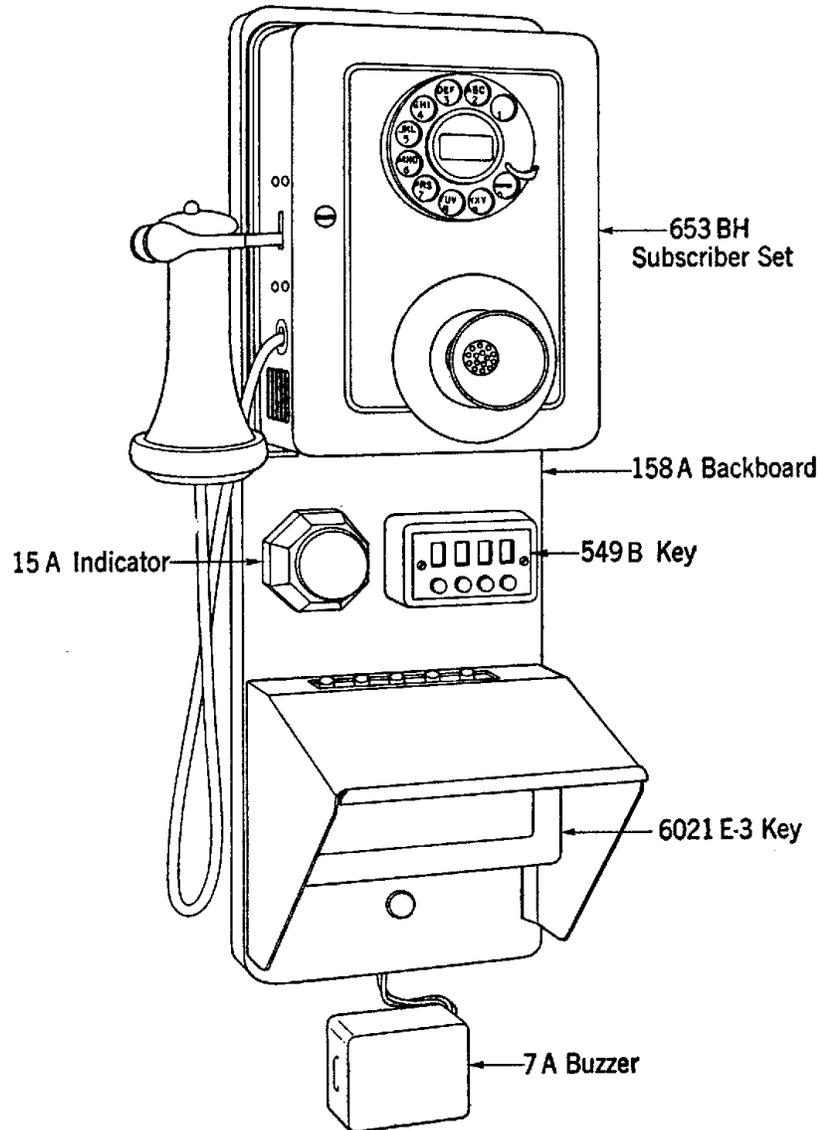


Fig. 6—23A Key Equipment.

3.06 A typical arrangement of equipment at a wall set station, using the 158A backboard, is illustrated in Fig. 7, which shows a line and intercommunicating key station with code and selective buzzer keys, line busy lamp and separately mounted buzzer.



**Fig. 7—Equipment Arrangement at Wall Set Station.**

#### **4. TALKING AND SIGNALING CURRENT SUPPLY**

4.01 Four arrangements are available for power supply for the key equipments, as follows:

- (a) Direct feed over cable pairs from a central office battery, 15-26 volt building battery, or a 15-20 volt battery of an associated P.B.X.
- (b) A local 15-20 volt battery charged over cable pairs from a central office.
- (c) A local 15-20 volt battery charged by a copper oxide rectifier from the house a.c. service.

(d) Where the house a.c. service is dependable and comparatively free from interruptions, a rectifying power unit such as the J86205A may be used.

4.02 Where a local storage battery is used, the battery is mounted together with its control apparatus in the standard metal battery cabinet which is similar in size and appearance to the standard 4-plate metal apparatus cabinet. ←

4.03 The batteries consist of four two-cell battery units of the sealed glass jar type equipped with colored charge indicators in the positive end of each two-cell unit. Rubber trays are provided under each two-cell unit.

4.04 Where the copper oxide charging rectifier or rectifying power unit is used, it is installed separately in the vicinity of the battery or apparatus cabinet.

## 5. DRAWINGS

5.01 Drawings for the key equipments are listed below. The circuit drawings and associated CD sheets are available in handbook size. ↗

Title	Drawing
Circuit Drawing—15A Key Equipment	SD-69074-01
Circuit Drawing—23A Key Equipment	SD-69075-01
Apparatus Cabinet Equipment and Cabling	ED-69090-01
Charge and Discharge Circuit	SD-80485-01 ↘

5.02 Wiring diagram and connections for the key equipment power unit are given in the section entitled "Station Wiring Plans—Buzzer and Key Equipment Power Unit Connections."

5.03 Where the J86205B rectifier is used for charging a local storage battery, it is connected as shown on SD-80590-01; otherwise the charging rectifier is connected as shown on SD-80485-01.