

STATION SYSTEMS
KEY EQUIPMENT NO. 103ASECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

This circuit schematic provides information on key equipment which is used for secretarial service on regular telephone lines which require an attendant to answer a call during a subscriber's absence. A call at the secretarial equipment is indicated by a visual and an audible signal. The visual signal associated with each line is a 3-element cold cathode tube which lights when the subscriber bell is being rung. A ringer without capacitor or buzzer is used for the audible signal at the secretarial equipment. The audible signal also operates during the ringing period and can be silenced by the operation of a key. The attendant answers a line by operating a lever-type key. Any standard subscriber telephone set may be connected as the attendant telephone set.

2. LINE CAPACITY

The line capacity of this key equipment is as follows:

- 10 lines per single keybox
- 20 lines per double keybox

For capacities in excess of 20 lines refer to the appropriate sections of the Bell System Practices.

SECTION II - DETAILED DESCRIPTION

1. LINE LAMP AND KEY, FIG. 1

1.1 Line Lamp

The visual signal for each line is a 359A electron tube L which is operated from the ringing voltage applied to the subscriber line. When ac-dc or negative superimposed ringing is applied to the ring of the line and ground to the tip, the control gap of the tube ionizes the gas in the tube and the main gap then breaks down allowing current to flow through the tube and the audible signal circuit to ground. This action occurs only on negative half cycles of the ringing current due to the rectifying action of the tube, therefore the visual signal will follow the ringing frequency. Resistor L limits the current through the control gap. If the audible signal cutoff key is normal the audible signal, Fig. 3 will sound.

1.2 Line Key

When the attendant operates the Line key associated with a lighted L lamp her telephone set will be connected to that line and the call can be answered in the normal manner. When the Line key is restored to normal the telephone set will be disconnected from the line.

2. AUDIBLE SIGNAL, FIG. 3.

2.1 One or More 608- or 756-Type PBX Lines Connected to Fig. 1

When one or more lines of a 608- or 756-type PBX are connected to Fig. 1 the audible signal shall consist of a high impedance ringer, C4A or equivalent, option X.

2.2 Lines Other Than 608- or 756-Type PBX Connected to Fig. 1

When lines other than those of 608- or 756-type PBXs are connected to Fig. 1, the audible signal may be either a high impedance ringer, C4A or equivalent, option X, a 4C or equivalent buzzer, option Y, or a 584DF subset, option Z.

3. AUDIBLE SIGNAL CUTOFF KEY, FIG. 2

The (Aud Sig) cutoff key is provided to silence the audible signal when desired. Operation of the key disconnects the audible signal and connects the A resistor in its place.

3.1 A Resistor3.1.1 One or More 608- or 756-Type PBX Lines Connected to Fig. 1

When one or more lines of a 608- or 756-type PBX are connected to Fig. 1, the A resistor shall be the KS-13491, List 1, 8200 ohms, option X.

3.1.2 Lines Other Than 608- or 756-Type PBX Connected to Fig. 1

When lines other than those of 608- or 756-type PBXs are connected to Fig. 1, the A resistor may be either the KS-13491, List 1, 8200 ohms, option X, or the 63-T, 2000 ohms, options Z and Y consistent with the information in 2.1, 2.2, and Note 102.

3.2 Varistor A

The A varistor prevents noise interference between lines which might result from voltage surges in the common circuitry of Fig. 2 and 3. Under normal conditions its resistance is very high. On surges due to dialing or switch hook operation on a line its resistance drops to a low value. This prevents breakdown of the gas tube L of Fig. 1 and interference on other lines.

4. CUTOFF KEY, FIG. 5

When the cutoff key of Fig. 5 is operated the subscriber line is connected directly to the key unit in addition to the subscriber station.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.1 Ringling Voltages

AC-DC or negative superimposed ringling must be used. Ringling voltage must be applied to the ring side of the line while ground is on the tip side as follows:

Office Type	Ringling Component Volts		Maximum Earth Potential Volts
	AC	DC	
Step-By-Step	80-88	30-52	5
	95-103	16-19	5
All Other	80-88	30-52	15

1.2 Multiples

Not more than two Fig. 1 shall be connected to one subscriber line.

1.3 Ringer and Buzzer Limitations

No line connected to Fig. 1 shall exceed the limitations shown in Table A.

TABLE A

Apparatus Option	Fig. 1	High Impedance Line Ringers
X	1	3
	2	2
Z or Y	1	2
	2	1

2. FUNCTIONAL DESIGNATIONS

None.

3. FUNCTIONS

This circuit:

- (a) Lights the line lamp L only while the subscriber line is being rung.
- (b) Operates the visual signal whenever a subscriber line is being rung unless the cutoff key at the station is operated.
- (c) Provides for cutting off the audible signal.
- (d) Provides for answering the subscriber line.

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) Standard Subscriber Telephone Set
- (b) Central Office Line Circuit
- (c) PBX Station Line Circuit

SECTION IV - REASONS FOR REISSUE

B. CHANGES IN APPARATUS

Superseded:

Superseded By:

L Resistor KS-8058- Fig. 1
 A Resistor 63T- Fig. 2, Z and Y
 584DF Subset Fig. 3, Z Option
 4C Buzzer, Fig. 3, Y Option

L Resistor KS-13490, L3, Fig. 1
 A Resistor KS-13491, L1- Fig. 2, X Option
 C4A or Equiv Ringer, Fig. 3 X Option

D. DESCRIPTION OF CHANGES

- D.1 The KS-8058 L resistor is superseded by the KS-13490, List 3 L resistor.

- D.2 The 63-T A resistor is rated Mfr Disc. for use in this circuit and is designated Z and Y options.
- D.3 The KS-13491, List 1 A resistor is rated AT&TCo Std for use in this circuit and is designated X option.
- D.4 The 4C buzzer is rated Mfr Disc. for use on this circuit and is designated Y option.

- D.5 The 584DF subset is rated Mfr Disc. for use in this circuit and is designated Z option. It is superseded by the C4A or equivalent ringer which is rated AT&TCo Std and designated X option.
- D.6 The 8200-ohm A resistor, option X, and the C4A or equivalent ringer option X, are added to permit use of this circuit on lines of 608- or 756-type PBXs.

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