



K-500 TELEPHONE HANDBOOK

INSTALLATION AND MAINTENANCE

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K-500 TELEPHONE HANDBOOK

INSTALLATION
AND
MAINTENANCE



KELLOGG SWITCHBOARD AND SUPPLY CO.
DIVISION of ITT CORPORATION

K-500

TELEPHONE HANDBOOK

INSTALLATION

AND

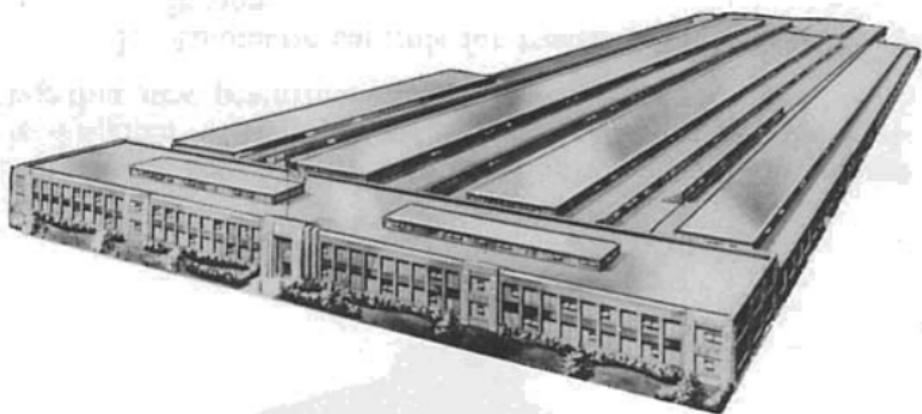
MAINTENANCE

KELLOGG SWITCHBOARD AND SUPPLY CO.
DIVISION of ITT CORPORATION



KELLOGG SWITCHBOARD AND SUPPLY COMPANY

Division of International Telephone and Telegraph Corporation



KELLOGG REGIONAL OFFICES

EASTERN

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Harrison 2-9251

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Lafayette 4-6511

NORTH CENTRAL

4600 South Tripp Avenue
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Cliffside 4-4300

WESTERN

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Burlingame, California
Oxford 7-5780

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Kansas City 15, Kansas
Mayfair 1-4418

SOUTHEASTERN

1594 Southland Circle, N.W.
Atlanta 18, Georgia
Sycamore 4-2441

SOUTHWESTERN

1515 Turtle Creek Boulevard
Dallas 2, Texas
Riverside 7-5191

EXPORT

157 Prospect Street
Passaic, New Jersey

FOREWORD**KELLOGG K-500****Speaks Best For Itself**

The K-500 Telephone, an outstandingly superior instrument is designed with ingenious simplicity to provide these altogether new performance advantages:

1. Automatic controls for transmission equalization.
2. Superior speech quality and transmission.
3. Improved transmission, dialing and ringing performance on much longer common battery lines.

This handbook was prepared by Kellogg Switchboard and Supply Company to serve as a guide for the installation and maintenance of the K-500 Telephone.

Kellogg Switchboard and Supply Company, A Division of ITT Corporation

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INSTALLATION AND TROUBLE SHOOTING

(See Section Two of K-500 Desk Telephone)

DIAL

(See Section Three of K-500 Desk Telephone)

HANDSET

(See Section Four of K-500 Desk Telephone)

RINGER

(See Section Five of K-500 Desk Telephone)

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SECTION ONE

**GENERAL
DESCRIPTION
KELLOGG K-500
TELEPHONE**

General Description—K-500 Telephone

Kellogg Switchboard and Supply Company, A Division of ITT Corporation



THE 500 DESK TYPE TELEPHONE

General Description—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

I. GENERAL DESCRIPTION

A. General

The Kellogg Code 500 Telephone denotes a standard common battery desk style telephone. All of the Code 500 Telephones may be used for dial or manual common battery services. Kellogg high impedance ringers are standard for Biased, Harmonic, Synchronic and Decimonic ringing services.

B. Major Components

The major components of the dial and manual desk telephone sets consist of the handset (with cord), housing-plunger assembly, base assembly, mounting cord, and connecting block. All components in the dial telephone are physically and electrically identical to those in the manual telephone except that, in the manual type set, the dial is replaced by a dummy plug assembly.

1. Handset and Handset Cord: For description see "Handset Section" of this Handbook. (Section Four)

2. Housing Plunger Assembly: The housing, which covers and protects the base assembly, has a cradle upon which the handset rests and a depression for use as a hand hold. The plunger assembly contains the two plungers for activating the cradle switch in the base when the handset is removed or replaced.

3. Base Assembly: The base assembly is attached to the housing-plunger assembly by two removable cabinet lock screws. When separated from the housing-plunger assembly, the base assembly consists of the dial, cradle switch assembly, ringer and network assembly, all mounted on a steel base plate.

a. Dial: For description see "Dial Section" of this Handbook. (Section Three)

b. Cradle Switch Assembly: The cradle switch assembly consists of an operating arm mounted on a pivot pin, a spring which raises the arm, an operating bar which ac-

tuates the contact springs, and a cover to protect the spring assembly. The entire assembly is mounted on a frame which is secured to the base plate by three removable screws. In function, the switch assembly connects the line, handset, dial and network.

c. Ringer: For description see "Ringer Section" of this Handbook. (Section Five)

d. Network Assembly: The network assembly consists of a terminal board mounted on a can assembly. The top side of the terminal board contains the terminal screws, at which telephone internal wiring and mounting cord are terminated. A transformer, capacitors, resistors, and varistors are mounted within the can assembly. These components, which are potted inside the network, provide sidetone balancing, transmission equalization, and suppression of radio frequency interference. The entire assembly is secured to the base plate by two removable screws. For circuit schematic, see Fig. 1, Page 7.

e. Base Plate: The base plate consists of the dial mounting bracket and a foot assembly at each corner to prevent scratching the surface upon which the telephone is placed. Two holes are provided in the rim of the base plate for attachment of the clamp hooks on the handset and mounting cords. This provides strain relief and prevents the cords from being pushed into the base and interfering with the operation of moving parts.

f. Connecting Block: The connecting block consists of a protective cover secured to a base assembly by a removable cabinet lock screw. The base assembly contains four terminals and screws for connecting the incoming line and mounting cord, two mounting holes, and a stop for the cord strain relief band of the mounting cord.

II. INSTALLATION

See "Installation and Trouble Shooting Section" of this Handbook. (Section Two—Page 23)

General Description—K-500 Telephone

Kellogg Switchboard and Supply Company, A Division of ITT Corporation

III. MAINTENANCE

A. For dial, handset and ringer maintenance, refer to specific section in this Handbook.

B. Maintenance Checks

1. Plungers: If the plungers bind or squeak, remove the housing-plunger assembly from the base assembly. Inside the housing, inspect the plungers, plunger holes, plunger retainer, and screw. Make sure the screw is not loose, and the plunger retainer is seated properly in the housing. Lubricate the plungers and plunger holes with Molykote or as instructed by local practices. If the binding or squeaks cannot be corrected, replace the plungers.

2. Cradle Switch Assembly: Except for lubrication of the pivot pins, field maintenance of the spring nest assembly must be performed by qualified personnel or only when permitted by the local practices. Proceed as follows: (See Fig. 3, Page 9.)

If lubrication is required, apply Molykote at the junction of the pivot pin with the operating arm and mounting frame.

On the spring nest assembly, make sure both contacts on contact spring assembly "b" have a perceptible follow. When the operating arm is in its upper position, there should be a minimum gap of 1/64 of an inch between the contacts of contact spring assemblies "a" and "b," and "g" and "f." When the operating arm is depressed, there should be a minimum gap of 1/64 of an inch between the contacts of contact spring assemblies "b" and "c," "e" and "d." In all cases, both contacts of a spring should make or break at the same time.

When either of the plungers is depressed to within 1/8 of an inch of the handset cradle supports of the housing, the line circuit should be open. Check this by eye. When the handset is lifted from the plungers, the contacts should make before the plungers come to a positive stop with contacts "g" and "f" opening last.

Caution

Do not permit the lubricant to fall on the contact springs of the cradle switch assembly.

C. Removal Procedures

1. Removal of Base Assembly from Housing-Plunger Assembly: Loosen the two cabinet lock screws at each end of the base plate. Remove the base assembly from the housing-plunger assembly. Be careful not to lose the gasket on the dial. Upon replacement, reassemble in the reverse order.

2. Plunger Assembly: Remove the base assembly from the housing-plunger assembly. Inside the housing assembly, remove the single screw. Then, carefully pull the plunger retainer forward, and lift it out of the housing assembly. Remove the two plungers. Upon replacement, reassemble in the reverse order. When replacing the plunger retainer, be sure to align the lip of the retainer with the key slot in the housing before replacing the screw.

3. Housing Assembly: Remove the base assembly from the housing-plunger assembly. Remove the plunger assembly. When disassembling the manual-type set, remove the dummy plug assembly. Upon replacement, reassemble in the reverse order.

4. Network Assembly: Remove the base assembly from the housing-plunger assembly. Disconnect and unsolder all conductors at the network assembly. Remove the two nuts, spring washers, and screws which secure the assembly to the base plate. Remove the network assembly. Upon replacement, reassemble in the reverse order.

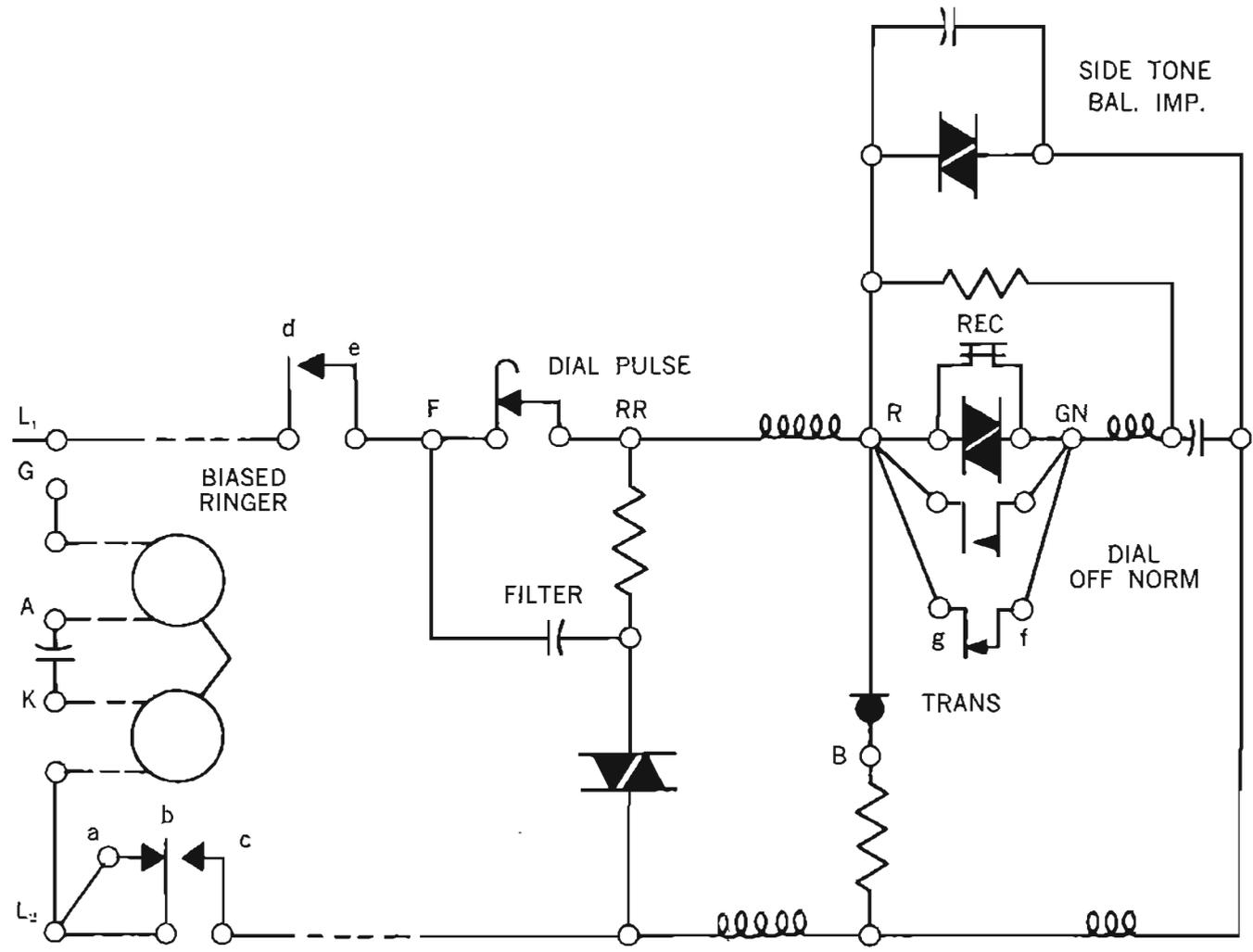
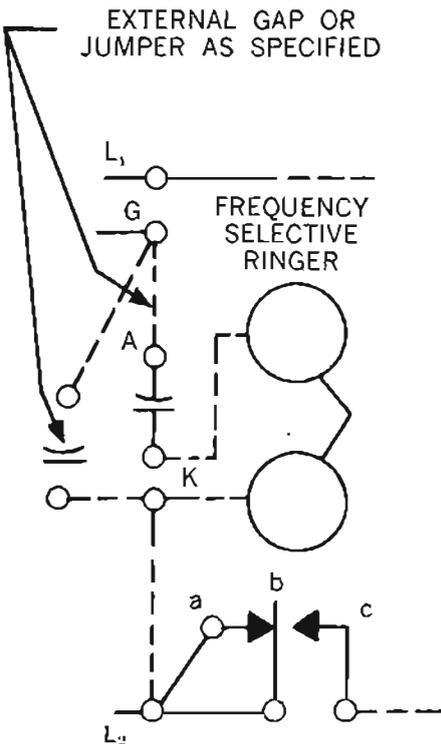


Figure 1

Circuit Schematic

General Description—K-500 Telephone
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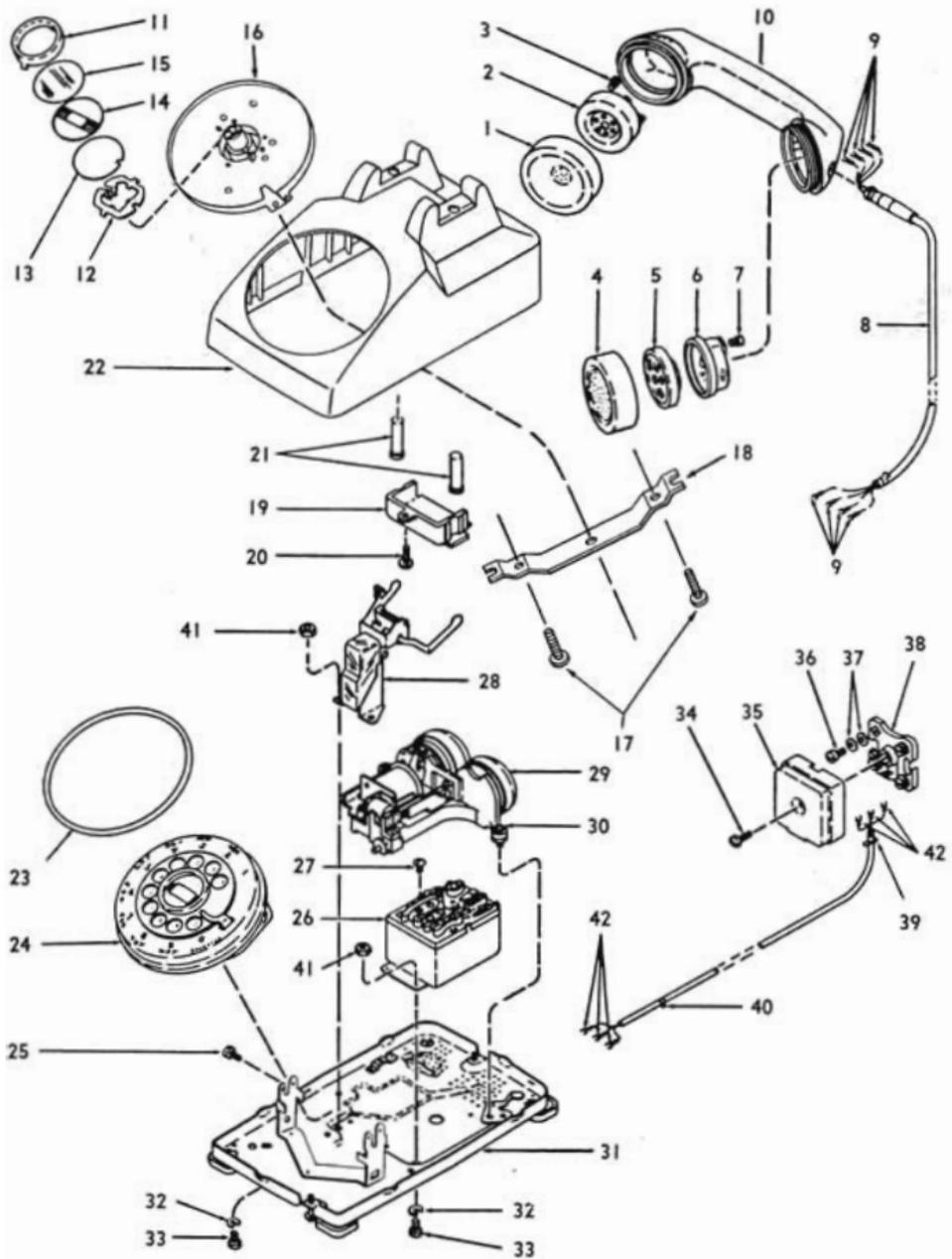


Figure 2

K-500 Desk Type Telephone—Exploded View

General Description—K-500 Telephone
 Kellogg Switchboard and Supply Company, A Division of ITT Corporation

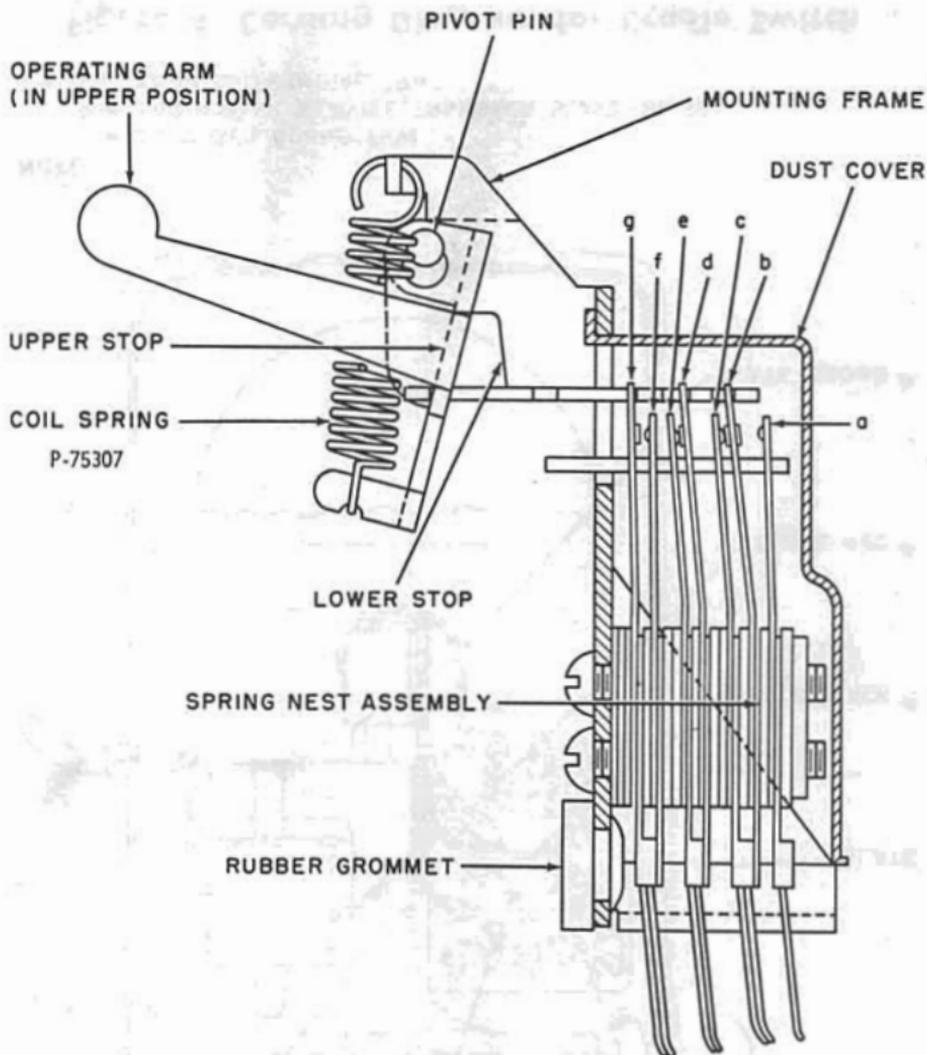
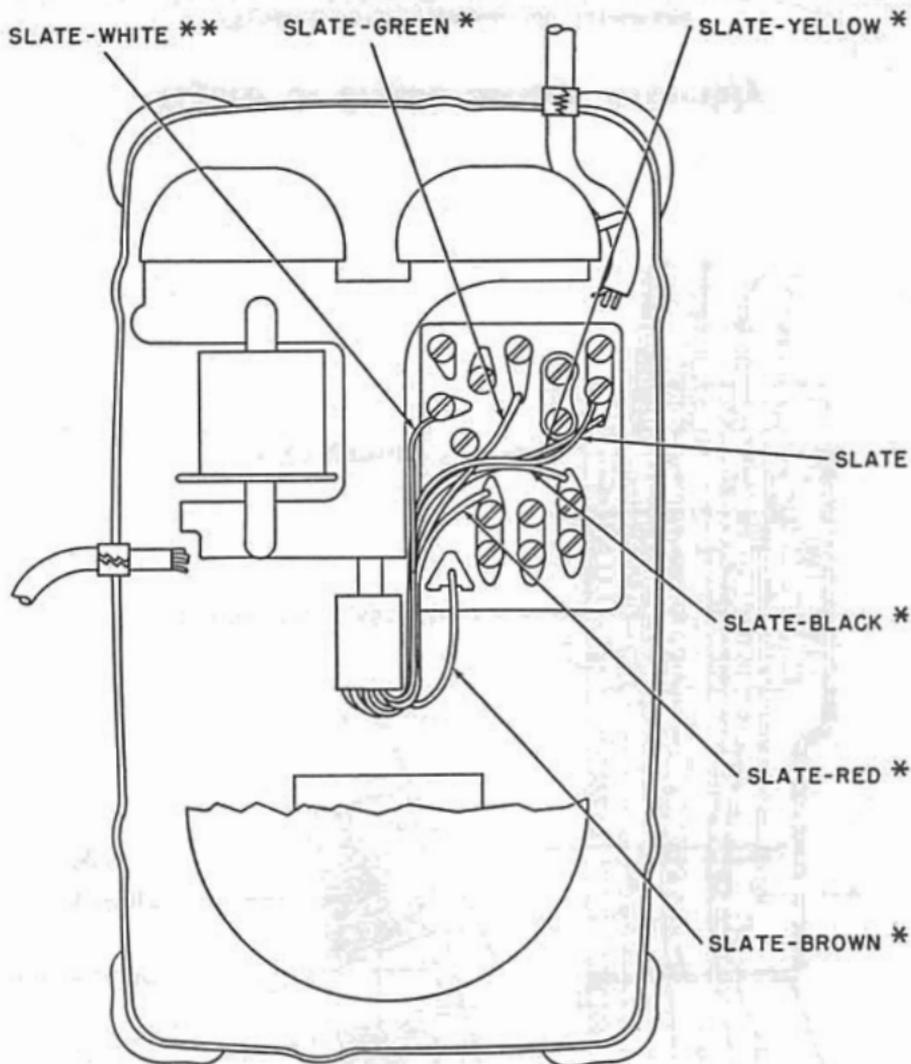


Figure 3. Cradle Switch Assembly

General Description—K-500 Telephone
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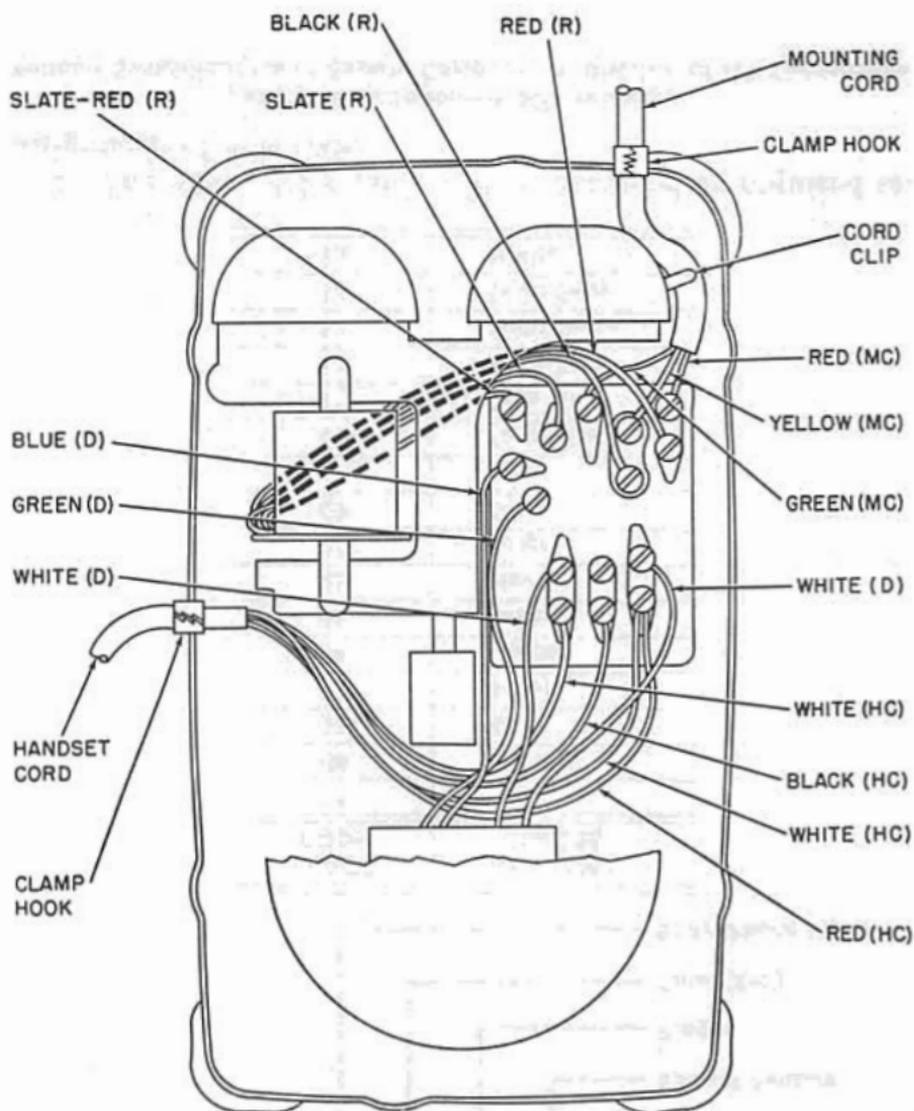


NOTE:

- * SOLDERED CONNECTION
- ** FOR MANUAL SERVICE, TRANSFER SLATE-WHITE LEAD TO TERMINAL "RR"

Figure 4. Cording Diagram for Cradle Switch Assembly

General Description—K-500 Telephone
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NOTE:

HC- HANDSET CORD
R- RINGER

MC- MOUNTING CORD
D- DIAL

Figure 5. Cording Diagram for Biased Ringer, Dial, Handset and Mounting Cord

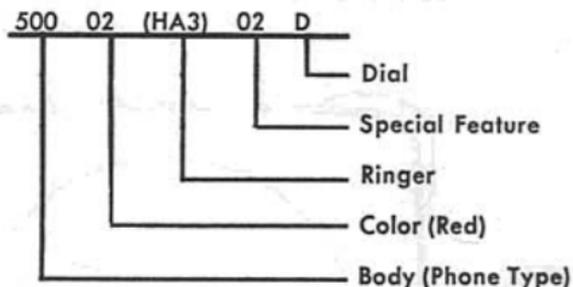
General Description—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

Figure 6 COLOR CODING PROCEDURE AND AVAILABLE COLORS

1. Telephone codes which include asterisks "***" are available in all colors listed in the table below.

For example:

If a 500** (HA3) 02D telephone is required in "red" the code number shall be specified as



COLOR CODE	AVAILABLE COLORS
**	
00	Black
02	Red
03	Brown
04	Yellow
05	Green
06	Blue
07	Beige
08	Gray
09	Ivory
10	Turquoise
11	Rose Pink
12	Aqua Blue
13	Light Beige
14	Light Gray
15	White

2. The above color table will be extended as required on assignment of new codes.

General Description—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

LIST OF REPLACEMENT PARTS

INDEX NO.	NAME OF PART	PART NO.	QTY.
24	Dial	See Dial Section of Handbook	1
25	Mounting Screw	75487 (2)	3
26	Network	75335	1
27	Terminal Screws	75392 (2)	15
28	Cradle Switch Assembly	75300	1
29 & 30	Ringer	See Ringer Section of Handbook	1
31	Base Plate	75327	1
32	Spring Washer	75436 (5)	5
33	Bind HD Machine Screw	69116 (3)	5
34	Cabinet Lock Screw	75545	1
35	Cover	75542	1
36	Bind HD Machine Screw	75487 (2)	4
37	Washer	75544	8
38	Base Assembly	75540	1
39	Cord Strain Relief Band	75410	1
40	Cord Clamp Hook	75351	1
41	Hex Nut	67093	5
42	Terminal	75325	6

* Stands for color digit designation.

COLOR PIECE PART SUFFIX

Digit	Color	Digit	Color	Digit	Color
(1)	Black	(6)	Blue	(11)	Rose Pink
(2)	Red	(7)	Beige	(12)	Aqua Blue
(3)	Brown	(8)	Gray	(13)	Light Beige
(4)	Yellow	(9)	Ivory	(14)	Light Gray
(5)	Green	(10)	Turquoise	(15)	White

General Description—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

Table II—K-500 DESK TYPE TELEPHONES WITH BIASED RINGERS

CODE NO.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	MOUNTING CORD	HANDSET	CIRCUIT DRAWING
50000(BA)00D	Ringer volume control. Straight cord.	1900(G)450	130(BA)470	303100(06)650	6500(C)410	21531
500**(BA)02D	Ringer volume control. Coiled cord.	19**(G)450	130(BA)470	3031**(06)650	65**(C2)410	21531
500**(BA)07D	Ringer volume control. Push button. Coiled cord.	19**(G)450	130(BA)470	3031**(06)650	65**(C2)410	21542
50000(BA)08D	Ringer volume control. Push button. Straight cord.	1900(G)450	130(BA)470	303100(06)650	6500(C)410	21542
50000(BA)09D	Ringer volume control. Lift-to-talk switch. Straight cord.	1900(G)450	130(BA)470	303100(06)650	6500(C)410	21551
50000(BA)11D	Ringer volume control. Dial light. 6 conductor mounting cord.	1900(1G)450	130(BA)470	304400(14)650	6500(C)410	21550
500**(BA)12D	Ringer volume control. 79857 Pushkey assembly. Coiled cord. Used with 1-14 ()851 Repeater.	19**(D)450	130(BA)470	3031**(06)650	65**(C2)410	21556
50000(BA)13D	Ringer volume control. Straight cord.	1900(G)450	130(BA)470	303100(06)650	6500(C)410	21531
500**(BA)14D	Ringer volume control. Coiled cord.	19**(D)450	130(BA)470	3031**(06)650	65**(C2)410	21531

General Description—K-500 Telephone

Kellogg Switchboard and Supply Company, A Division of ITT Corporation

Table II, Continued—K-500 DESK TYPE TELEPHONES WITH BIASED RINGERS

CODE NO.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	MOUNTING CORD	HANDSET	CIRCUIT DRAWING
500**(BA)15D	Ringer volume control. Coiled cord. Lift-to-talk switch.	19**(G)450	130(BA)470	3031**(06)650	65**(C2)410	21551
50000(BA)16D	Ringer volume control. 1-79467 terminal board assembly. 1-79468 mounting plate. Used with dial "9" intercom system.	1900(D)450	130(BA)470	303800(13)650	6500(C)410	21569
500**(BA)17D	Ringer volume control. 1-79467 terminal board assembly. 1-79468 mounting plate. Used with dial "9" intercom system. Coiled cord.	19**(G)450	130(BA)470	3038**(13)650	65**(C2)410	21569
50000(BA)00N	Ringer volume control. Straight cord.	Dummy Plug	130(BA)470	303100(06)650	6500(C)410	21531
500**(BA)02N	Ringer volume control. Coiled cord.	Dummy Plug	130(BA)470	3031**(06)650	65**(C2)410	21531
50000(BA)09N	Ringer volume control. Lift-to-talk switch. Straight cord.	Dummy Plug	130(BA)470	303100(06)650	6500(C)410	21551
500**(BA)15N	Ringer volume control. Lift-to-talk switch. Coiled cord.	Dummy Plug	130(BA)470	3031**(06)650	65**(C2)410	21551

Table III—K-500 DESK TYPE TELEPHONES WITH FREQUENCY SELECTIVE RINGERS

CODE NO.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	MOUNTING CORD	HANDSET	CIRCUIT DRAWING
50000(HA1 to 5)00D	Ringer volume control. Straight cord.	1900(G)450	131(HA1 to 5)470	303100(06)650	6500(C)410	21531
500**(HA1 to 5)02D	Ringer volume control. Coiled cord.	19**(G)450	131(HA1 to 5)470	3031**(06)650	65**(C2)410	21531
50000(HA1 to 5)03D	Less ringer volume control. Straight cord.	1900(G)450	133(HA1 to 5)470	303100(06)650	6500(C)410	21531
500**(HA1 to 5)06D	Less ringer volume control. Coiled cord.	19**(G)450	133(HA1 to 5)470	3031**(06)650	65**(C2)410	21531
50000(HA1 to 5)09D	Ringer volume control. Lift-to-talk switch. Straight cord.	1900(G)450	E131(HA1,2,3)470&131(HA4,5)470	303100(06)650	6500(C)410	21551
50000(HA1 to 5)10D	Coiled cord. Lift-to-talk switch. Less ringer volume control.	1900(G)450	E133(HA1,2,3)470&133(HA4,5)470	303100(06)650	6500(C)410	21551
50000(HA1 to 5)00N	Ringer volume control. Straight cord.	Dummy Plug.	131(HA1 to 5)470	303100(06)650	6500(C)410	21531
500**(HA1 to 5)02N	Ringer volume control. Coiled cord.	Dummy Plug.	131(HA1 to 5)470	3031**(06)650	65**(C2)410	21531
50000(HA1 to 5)03N	Less ringer volume control. Straight cord.	Dummy Plug.	133(HA1 to 5)470	303100(06)650	6500(C)410	21531
500**(HA1 to 5)06N	Less ringer volume control. Coiled cord.	Dummy Plug.	133(HA1 to 5)470	3031**(06)650	65**(C2)410	21531
50000(HB1 to 5)00D	Ringer volume control. Straight cord.	1900(G)450	131(HB1 to 5)470	303100(06)650	6500(C)410	21531
500**(HB1 to 5)02D	Ringer volume control. Coiled cord.	19**(G)450	131(HB1 to 5)470	3031**(06)650	65**(C2)410	21531
50000(HB1 to 5)03D	Less ringer volume control. Straight cord.	1900(G)450	133(HB1 to 5)470	303100(06)650	6500(C)410	21531
500**(HB1 to 5)06D	Less ringer volume control. Coiled cord.	19**(G)450	133(HB1 to 5)470	3031**(06)650	65**(C2)410	21531

**Table III, Continued—K-500 DESK TYPE TELEPHONES WITH
FREQUENCY SELECTIVE RINGERS**

CODE NO.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	MOUNTING CORD	HANDSET	CIRCUIT DRAWING
50000(HB1 to 5)09D	Ringer volume control. Lift-to-talk switch. Straight cord.	1900(G)450	131(HB1,5)470 & E131(HB2,3,4)470	303100(06)650	6500(C)410	21551
50000(HB1 to 5)10D	Coiled cord. Lift-to-talk switch. Less ringer volume control.	1900(G)450	133(HB1,5)470 & E133(HB2,3,4)470	303100(06)650	6500(C2)410	21551
50000(HB1 to 5)00N	Ringer volume control. Straight cord.	Dummy Plug.	131(HB1 to 5)470	303100(06)650	6500(C)410	21531
500**(HB1 to 5)02N	Ringer volume control. Coiled cord.	Dummy Plug.	131(HB1 to 5)470	3031**(06)650	65**(C2)410	21531
50000(HB1 to 5)03N	Less ringer volume control. Straight cord.	Dummy Plug.	133(HB1 to 5)470	303100(06)650	6500(C)410	21531
500**(HB1 to 5)06N	Less ringer volume control. Coiled cord.	Dummy Plug.	133(HB1 to 5)470	3031**(06)650	65**(C2)410	21531
50000(HC1 to 5)00D	Ringer volume control. Straight cord.	1900(G)450	131(HC1 to 5)470	303100(06)650	6500(C)410	21531
500**(HC1 to 5)02D	Ringer volume control. Coiled cord.	19**(G)450	131(HC1 to 5)470	3031**(06)650	65**(C2)410	21531
50000(HC1 to 5)03D	Less ringer volume control. Straight cord.	1900(G)450	133(HC1 to 5)470	303100(06)650	6500(C)410	21531
500**(HC1 to 5)06D	Less ringer volume control. Coiled cord.	19**(G)450	133(HC1 to 5)470	3031**(06)650	65**(C2)410	21531
50000(HC1 to 5)09D	Ringer volume control. Lift-to-talk switch. Straight cord.	1900(G)450	131(HC1,3)470 & E131(HC2,4,5)470	303100(06)650	6500(C)410	21551

**Table III, Continued—K-500 DESK TYPE TELEPHONES WITH
FREQUENCY SELECTIVE RINGERS**

CODE NO.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	MOUNTING CORD	HANDSET	CIRCUIT DRAWING
50000(HC1 to 5)10D	Coiled cord. Lift-to-talk switch. Less ringer volume control.	1900(G)450	133(HC1,3)470 & E133(HC2,4,5)470	303100(06)650	6500(C2)410	21551
50000(HC1 to 5)00N	Ringer volume control. Straight cord.	Dummy Plug	131(HC1 to 5)470	303100(06)650	6500(C)410	21531
500**(HC1 to 5)02N	Ringer volume control. Coiled cord.	Dummy Plug	131(HC1 to 5)470	3031**(06)650	65**(C2)410	21531
50000(HC1 to 5)03N	Less ringer volume control. Straight cord.	Dummy Plug	133(HC1 to 5)470	303100(06)650	6500(C)410	21531
500**(HC1 to 5)06N	Less ringer volume control. Coiled cord.	Dummy Plug	133(HC1 to 5)470	3031**(06)650	65**(C2)410	21531

Table IV—K-500 DESK TYPE TELEPHONES LESS RINGERS

CODE NO.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	MOUNTING CORD	HANDSET	CIRCUIT DRAWING
59100(LR)00D	3 Conductor Mounting Cord. Straight Cord.	1900(G)450	Less Ringer	303100(06)650	6500(C)410	21531
59100(LR)02D	3 Conductor Mounting Cord. Coiled Cord.	1900(G)450	Less Ringer	303100(06)650	6500(C2)410	21531
59100(LR)03D	3 Conductor Mounting Cord. Lift-to-Talk Switch. Straight Cord.	1900(G)450	Less Ringer	303100(06)650	6500(C)410	21551
59100(LR)04D	With 79467 terminal board assembly and 79468 mounting plate. Used with Dial "9" System. Straight Cord.	1900(D)450	Less Ringer	303800(13)650	6500(C)410	21569
59100(LR)05D	With 79467 terminal board assembly and 79468 mounting plate. Used with Dial "9" System. Coiled Cord.	1900(D)450	Less Ringer	303800(13)650	6500(C2)410	21569
591**(LR)02D	3 Conductor Mounting Cord. Coiled Cord.	19**(G)450	Less Ringer	3031**(06)650	65**(C2)410	21531
591**(LR)05D	With 79467 terminal board assembly and 79468 mounting plate. Used with Dial "9" System. Coiled Cord.	19**(D)450	Less Ringer	3038**(13)650	65**(C2)410	21569

Table IV, Continued—K-500 DESK TYPE TELEPHONES LESS RINGERS

CODE NO.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	MOUNTING CORD	HANDSET	CIRCUIT DRAWING
59100(LR)00N	3 Conductor Mounting Cord. Straight Cord.	Dummy Plug	Less Ringer	303100(06)650	6500(C)410	21531
59100(LR)02N	3 Conductor Mounting Cord. Coiled Cord.	Dummy Plug	Less Ringer	303100(06)650	6500(C2)410	21531
59100(LR)03N	3 Conductor Mounting Cord. Lift-to-Talk Switch. Straight Cord.	Dummy Plug	Less Ringer	303100(06)650	6500(C)410	21551
591**(LR)02N	3 Conductor Mounting Cord. Coiled Cord.	Dummy Plug	Less Ringer	3031**(06)650	65**(C2)410	21531

SECTION TWO

INSTALLATION

AND

TROUBLE

SHOOTING

Installation and Trouble Shooting Section—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

INSTALLATION AND TROUBLE SHOOTING SECTION

I. GENERAL INSTALLATION PROCEDURES

A. Unpacking Procedure

Before unpacking the telephone set, examine the box for evidence of external damage. If the box or its contents has been damaged, report the matter in accordance with local practices.

B. Number Card

1. Dial-type Set: To install the number card, remove and disassemble the number card assembly. Place the number card between the protector and the retainer disc. Reassemble and remount the number card assembly on the dial.

2. Manual-type Set: If the dummy plug assembly is already installed, mount the number card in the same manner as explained for the dial-type set. However, if a dial set is to be converted for manual service, remove the dial and mount the dummy plug assembly. Then, mount the number card in the number card assembly.

C. Location of Telephone Set

The telephone set should be located in accordance with the subscriber's wishes and local practices. If the subscriber's wishes cannot be fulfilled, the installer should clearly explain the reasons. However, when satisfactory arrangements cannot be made, the local supervisor should be consulted before proceeding with the installation. The following general rules should be observed to properly locate the telephone set.

1. Power Stations: Do not install the set in electric power stations unless a local service order indicates the required protective device.

2. Explosive Areas: Do not install the set in areas that contain explosive gases until the local supervisor has been consulted.

3. **Hazardous Grounds:** Avoid locations that are over or near a grounded metallic object such as a radiator, sink, or electric outlet. This is especially important at locations where station protectors are installed in the line circuit and the protector ground wire is connected to a ground rod.

When it is impossible to obtain adequate separation from such objects, use short mounting cords, coiled handset cords, or other remedial measures indicated in the local practices.

4. **Ringer Audibility:** Locate the set where the ringing signal can clearly be heard throughout the subscriber's premises. Where maximum ringer sound output is required and the subscriber desires the set to be placed on a sound absorbing material (a soft cover or pad), inform the subscriber that such material usually reduces the sound volume. Additional requirements for ringer audibility should be obtained from local practices.

5. **Dial Visibility:** Be sure the set is located where there will be sufficient light for dialing both at night and during the day.

6. **Accessibility:** Locate the set where it will be accessible for inspection. Avoid locations at which the set may be damaged or will be a hazard.

7. **Vibration:** Do not locate the set on a desk or table which may be subjected to considerable vibration. If an alternate location is impractical, consult the local supervisor.

8. **Inductive Noise:** To avoid inductive noise, locate the set at least 12 inches from 20-watt fluorescent light units, and at least 24 inches from 40-watt units. Locate the set as far as possible from neon signs, lights, or other apparatus known to induce disturbances in the telephone.

D. Location of Connecting Block

The location of the connecting block primarily will be affected by the location of the telephone set. However, the following considerations should be kept in mind.

Installation and Trouble Shooting Section—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

1. Avoid locations that are hazardous to installers, repairmen, and subscribers.

2. Locate the connecting block where it will be accessible for repair or maintenance. Avoid closets.

3. Do not locate the connecting block near radiators or steam pipes. The plastic base assembly may be damaged by heat.

4. Mount the connecting block on a backboard, when the wall location is damp or uneven.

E. Connections

The connections at the connecting block and terminal board of the network assembly will depend upon the type of ringing (biased or frequency selective) and the ringing service. (See circuit information in "Ringer Section" of this Handbook, Section Five.)

II. TESTS WITH TROUBLE DESK— COMMON BATTERY STATIONS

The tests discussed in this paragraph should be performed upon completion of the installation procedures, inspection, trouble shooting, checks and adjustments, and removal and replacement of parts. The test should be made with the aid of a test deskman on the dial set or the manual set in accordance with local practices. For tests at P.B.X. stations, the local supervisor should be consulted for detailed instructions.

A. Ringing and Bell Tapping

Dial the proper test code or call the test deskman to make the set ring. If ringer does not ring or the bell taps, refer to table 1 for the remedy.

B. Transmission and Reception

Lift the handset and hold it in a vertical position. Contact and talk to the test deskman. Talk directly into the transmitter in a natural conversational tone. The lips should be almost touching the transmitter cap. Check for normal

sidetone during this test. Check for difficult reception. Ask the test deskman if transmission is clear. If trouble is encountered in either case, refer to table 1 for the remedy.

C. Dial Speed

Make a dial speed test with the test deskman or in accordance with other local practices.

D. Noise

With the handset held firmly at the ear and mouth, shake the mounting cord and then the handset cord. If excessive noise is heard and it changes in magnitude as a cord is shaken, check the cord and replace it if necessary. Test the transmitter for excessive noise by blowing gently into it. If the noise changes in magnitude during the test, then the transmitter unit is defective, and should be replaced. If either a cord or the transmitter is replaced, repeat tests A through C.

III. TROUBLE SHOOTING

When trouble shooting, use the following data as a guide to facilitate locating and correcting the fault. Listed are the trouble symptoms, probable cause, and the suggested remedy. However, the actual procedure for remedying the trouble and making repairs will depend upon local practices. Thus, when a component is defective replace the component or the telephone set as specified.

TABLE I

SYMPTOM	PROBABLE CAUSE	REMEDY
1. Bell does not ring.	a. Wrong ringer. b. Ringer disconnected or wired wrong. c. Control wheel in cut-off position.	a. Check code number on ringer against required ringer on service order. Replace with correct ringer or telephone set. b. Check ringer connections. c. Adjust to ring position.

Table 1, Continued

SYMPTOM	PROBABLE CAUSE	REMEDY
	<ul style="list-style-type: none"> d. Open winding in coil assembly. e. Foreign obstruction between magnet or gongs and clapper. f. No ground (party lines). g. Open ringing capacitor. h. Ringer connected for silencing. 	<ul style="list-style-type: none"> d. Replace coil assembly, or replace ringer. e. Remove obstruction. f. Consult local practices. g. Replace network or capacitor. h. Rewire or adjust for operation.
2. Bell volume too loud.	<ul style="list-style-type: none"> a. Control wheel in wrong position. b. One or both gongs too loose. 	<ul style="list-style-type: none"> a. Rotate control wheel to lower position. b. Tighten mounting screws.
3. Bell volume too low.	<ul style="list-style-type: none"> a. Control wheel in wrong position. b. Foreign obstructions or wire between gong and weight on clapper rod. c. Telephone set on sound-absorbent material. 	<ul style="list-style-type: none"> a. Rotate control wheel to higher position. b. Remove obstruction, or check cording. c. Relocate on hard surface in conjunction with subscribers wishes or consult local practices.
4. Bell taps while dialing or operating plungers.	<ul style="list-style-type: none"> a. Incorrect line or ringer connection. b. Biasing spring wire in low notch of spring wire bracket. 	<ul style="list-style-type: none"> a. Check connections. b. Check and adjust to high notch. If bell continues to tap, replace ringer or telephone set.
5. Bell rings when other party is called. Cross ring or false ring.	<ul style="list-style-type: none"> a. Incorrect line or ringer connections. b. Ringing frequency source wrong for frequency selective ringer. c. Frequency selective ringer not tuned to ringer frequency. d. Wrong capacitor or connection for frequency selective ringer. 	<ul style="list-style-type: none"> a. Check line and ringer connections. b. Check ringer frequency in accordance with local practices. c. Replace with correct ringer or replace telephone set. d. Check ringer connections or replace with correct capacitor.

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Table I, Continued

SYMPTOM	PROBABLE CAUSE	REMEDY
6. Bell continually rings when handset is lifted.	<ul style="list-style-type: none"> a. Open in handset cord, transmitter unit, or dial pulse contacts. b. Open in induction coil or equalizer of network assembly. c. Open in telephone set wiring. d. Line contacts do not close in spring nest assembly of cradle switch assembly. 	<ul style="list-style-type: none"> a. Replace handset cord, transmitter unit or dial. b. Replace network assembly or telephone set. c. Replace telephone set. d. Make sure ears of plastic cover are in notches on mounting frame. If trouble continues, replace cradle switch assembly or telephone set.
7. Bell rings but no one on line.	<ul style="list-style-type: none"> a. Open handset cord or receiver unit. b. Off-normal contacts of dial are closed. c. Open induction coil or transmission condenser in network assembly. d. Receiver contacts do not open in spring nest assembly of cradle switch assembly. 	<ul style="list-style-type: none"> a. Replace handset cord or receiver unit. b. Replace dial or telephone set. c. Replace network assembly or telephone set. d. See remedy "d" of 6, above.
8. No dial tone.	<ul style="list-style-type: none"> a. Open in mounting or handset cord. b. Defective receiver unit. c. Pulse contacts are open or off-normal contacts of dial are closed. d. Open induction coil in network assembly e. Contacts do not open in spring nest assembly of cradle switch assembly. 	<ul style="list-style-type: none"> a. Replace cord. b. Replace receiver unit. c. Replace dial or telephone set. d. Replace network assembly or telephone set. e. See remedy "d" of 6, above.

Table I, Continued

		REMEDY
9. Cannot break dial tone.	<ul style="list-style-type: none"> a. Pulse contacts do not open in dial. b. Dial filter or ringing condenser is short-circuited. c. Defective receiver varistor. 	<ul style="list-style-type: none"> a. Replace dial or telephone set. b. Replace network, telephone set or the external ringing capacitor. c. Replace receiver unit.
10. Loud clicks while dialing.	<ul style="list-style-type: none"> a. Off-normal contacts do not close in dial. b. Loose connection. 	<ul style="list-style-type: none"> a. Replace dial or telephone set. b. Check connections.
11. Cannot hear.	<ul style="list-style-type: none"> a. Open receiver unit or handset cord. b. Off-normal contacts do not open in dial. c. Open induction coil in network assembly. d. Receiver contacts do not open in spring nest assembly of cradle switch assembly. 	<ul style="list-style-type: none"> a. Replace receiver unit or handset cord. b. Replace dial or telephone set. c. Replace network assembly or telephone set. d. See remedy "d" of 6, above.
12. Other party cannot hear.	<ul style="list-style-type: none"> a. Open in transmitter unit. b. Handset cord is open or connection loose. 	<ul style="list-style-type: none"> a. Replace transmitter unit. b. Replace handset cord or check connections.
13. High sidetone.	Defective sidetone balancing network in network assembly.	Replace network assembly or telephone set.
14. Interference from radio transmitter station.	Telephone set located close to radio station.	Install a.02mf. suppression condenser (75559) at network terminals as follows: connect one condenser lead to terminal "F" and the other lead to terminal "L2".

SECTION THREE
DIAL

General Dial Section—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

I. GENERAL DIAL DESCRIPTION

The dial consists of the number card assembly, finger plate, numeral ring, finger stop, and the dust-cover protected gear and contact spring assemblies. The characters on the numeral ring are outside the finger plate, providing greater visibility over a wide angle of sight. In addition, the characters are white on a black background, or black on a light colored background, with a marker spot under each finger hole to facilitate dialing. The contact spring assemblies consist of a pair of off-normal contacts and a pair of pulse contacts. When closed, the off-normal contacts short-circuit the receiver. The dial is attached to a mounting bracket by two removable screws. In the manual-type set, the dial is replaced by the dummy plug assembly consisting of a dummy plug and clamping plate with the number card assembly.

FIG 1.
TYPE D

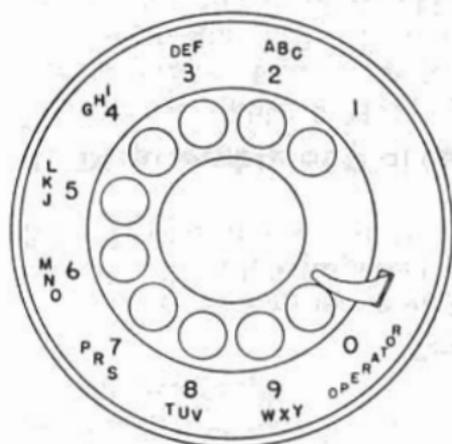
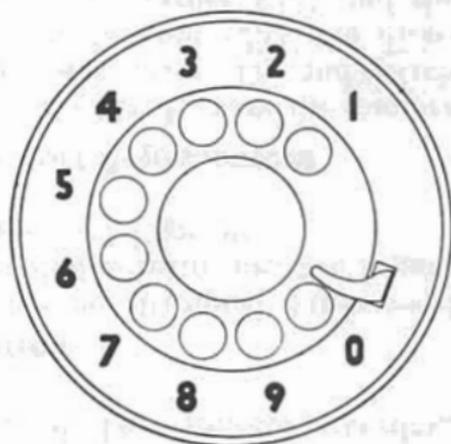


FIG. 2.
TYPE G



DIALS FOR K-500 TELEPHONES

Type G—Metropolitan Dial, Letters and Numerals
Type D—Dial, Numerals Only

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II. MAINTENANCE

A. Dial or Dummy Plug Assembly. Make sure the Dial or Dummy Plug is mounted securely. Test speed of Dial if Dial type set has been installed.

B. The following paragraphs 1 through 3 explain the replacement and adjustment of Dial parts. Refer to Figures 3 and 4, and determine which of the following paragraphs pertain to the part being replaced. Then proceed according to that paragraph.

Caution

These replacements should not be attempted unless local facilities include equipment for dial adjustments. See Figure 3 for Exploded View of 19 Type Dial Page 40.

1. Disassembly of Dial for Part Replacement

a. Disassembly of Main Spring (14). Remove the number card assembly. Loosen the finger stop screw (17) and detach the finger stop (12). Unscrew the hex nut (25) and disassemble the finger plate (11), spring washer (24) and the cam (8) and spring assembly (14). To reassemble, place the short formed end of the main spring into the retaining hole of the cam and loop one turn of the spring over the two cam projections. Then seat the other end of the spring back into the dial base (3) and pre-tension it two full turns in a clockwise direction before re-setting the cam on the main shaft (7). Reassemble the remaining parts in the reverse order.

b. Numeral Ring (27). Remove the main spring. Unscrew the two mounting screws (16) and remove the numeral ring (27). Upon replacement, reassemble in the reverse order.

c. Spring Assembly (28). Unscrew the two dust cover mounting screws (18) and lift the dust cover (13). Then remove the two spring assembly mounting screws (20) and detach the spring assembly (28). Upon replacement, reassemble in the reverse order.

Caution

Before tightening the spring assembly mounting screws, place the cam riding surface of the pulsing spring on the side of the pulsing cam.

d. Gear Train Assembly (4). Remove the dust cover (13) and the spring assembly (28). Unscrew the gear train mounting screws (19). Loosen the main gear mounting nut (26), and raise the main gear (5) enough to allow the gear train assembly to clear the mounting bosses. Remove the gear train. When replacing the gear train, set the impulse cam (10) so that its normal position is as shown in Figure 4, Page 41. Upon replacement, reassemble in the reverse order.

e. Main Shaft (7). Remove the main spring (14), dust cover (13) and spring assembly (28). Then remove the main gear hex nut (26), and slide the main shaft (7) out from the front end of the dial. Upon replacement, reassemble in the reverse order.

f. Metal Number Card Assembly. Remove the two tabs of the retainer ring (29) from the dial and remove the Number Card Assembly. This is necessary in order to remove the retainer spring (32), retainer disc (31), number card (6), and protector (30). Upon replacement, reassemble in the reverse order. See Pages 42 and 43 for Lucite Number Card Assembly Replacement.

2. Lubrication

Normally, the 19 Type Dial should require no lubrication for several years. However, under adverse conditions, the following parts of the dial may need field lubrication in order to continue smooth mechanical performance. Excessive oil should not be permitted to remain on any surface as it tends to collect dirt. Use an approved dial lubricant only, such as the Kellogg 79946 Dial Lubricant.

Apply oil to the following points on the gear assembly:

- a. the bearing surfaces of all gear shafts.
- b. the bearing surfaces of the clutch assembly.

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Caution

Keep oil away from internal parts of the governor drum.

Lubricate the gear teeth surfaces of all five gears with one dip of oil each applied with a brush which has been dipped in the lubricant and then scraped on the edge of the container to remove the surplus oil.

3. Dial Adjustments

a. When to adjust the dial.

1) For normal applications, dials which meet the following requirements need no re-adjustment.

<i>Speed</i>	<i>% Break</i>
9-11 p.p.s.	61½ plus or minus 4%

2) When dials fall outside of the above limits, they should be re-adjusted to the requirements shown below:

<i>Speed</i>	<i>% Break</i>
9.5-10.5 p.p.s.	62 plus or minus 2%

3) In cases where the total circuit resistance exceeds 1000 ohms, dials which meet the requirements shown below need no re-adjustment:

<i>Speed</i>	<i>% Break</i>
9.5-10.5 p.p.s.	62+2 -4%

4) When dials for circuits exceeding 1000 ohms fall outside of the limits per paragraph 3), they should be re-adjusted to meet requirements of paragraph 2).

In view of variances in trunk characteristics and system requirements, no single per cent break value can be considered as optimum. In exceptional cases, where such may deviate radically from the above given values, special adjustments may be required.

In general, the various dial pulse receivers such as step-by-step selectors, dialing relays and counters have capabilities broader than the requirements for the dial. This provides a margin for satisfactory service.

b. Gear Train Adjustment. The gear train assembly (4) is a separate unit which mounts to the dial base with two

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screws (19) thru enlarged holes in the bottom gear train bracket. These enlarged holes permit mesh adjustment of the drive pinion with the main gear. Loosen the two mounting screws (19) and adjust for minimum gear noise. Check for a binding condition by slowly winding and unwinding the finger plate. If binding exists, gradually decrease the amount of mesh until the binding is eliminated. Tighten the gear train mounting screws securely.

c. Dial Speed Adjustment. The dial speed is controlled by the "end to end" tension of the spring which straddles the two governor weights. To increase the dial speed, increase the spring "end to end" tension. To decrease dial speed, decrease the spring "end to end" tension. A common pair of tweezers with jaws approximately $3/32$ " wide can be used for this purpose. This adjustment should be performed in a manner which will keep the spring in a plane parallel with the bottom of the governor drum. First over-tension the spring, and then approach the desired dial speed by progressively taking tension out of the spring.

d. Spring Adjustment. Refer to Figure 4.

1. Shunt Springs. The contact separation between the shunt springs in the normal dial position should be .015" minimum. In the operated position, adjust the contact pressure to 20 grams minimum.

2. Pulsing Springs. All contact spring adjustments, except the % make adjustment shall be made at the base of the springs. The contact pressure of the adjusted pulsing springs shall be 15 to 20 grams. With spring "B" held open manually, and with the dial in the normal position, spring "A" shall rest against the impulse cam with a force of 10-20 grams.

The position of the cam riding surface of the pulsing spring "A" determines the percentage make and break of the dial pulsed. These can be adjusted with a spring adjusting tool by bending at point "X." Bending this surface away from the impulse cam increases the pulse "break" time, and vice versa.

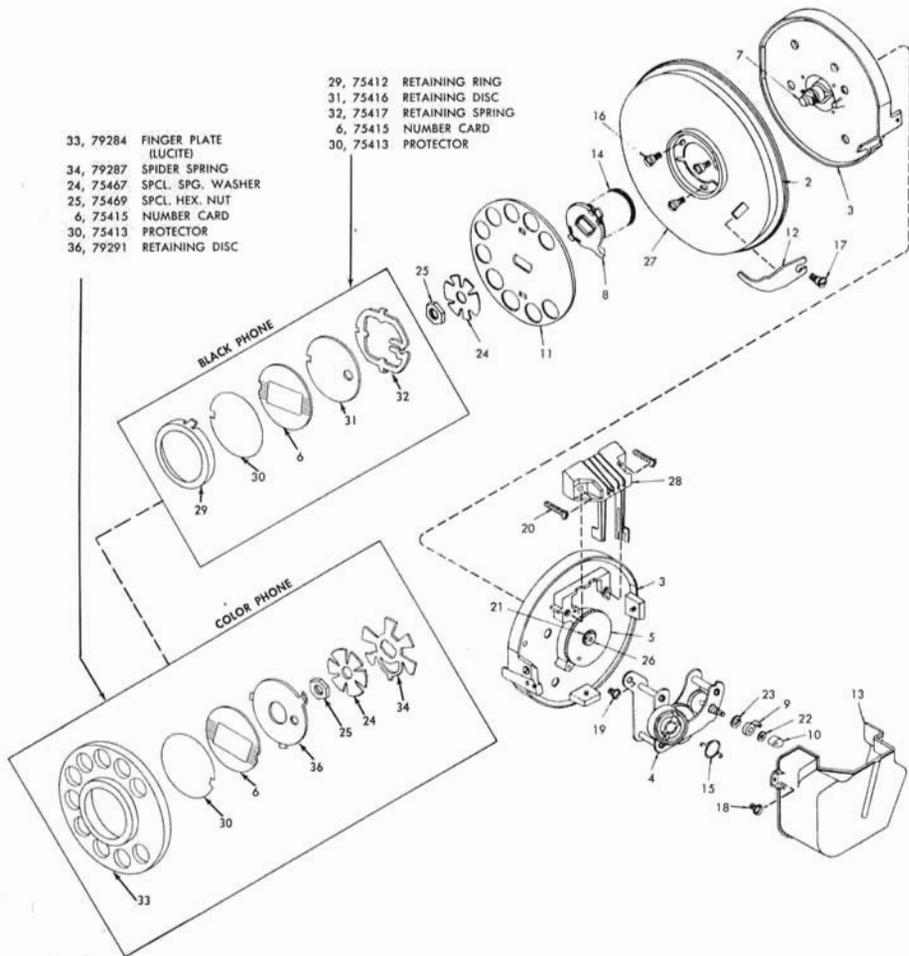


Figure No. 3
19 Type Dial—Exploded View

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Kellogg Switchboard and Supply Company, A Division of ITT Corporation

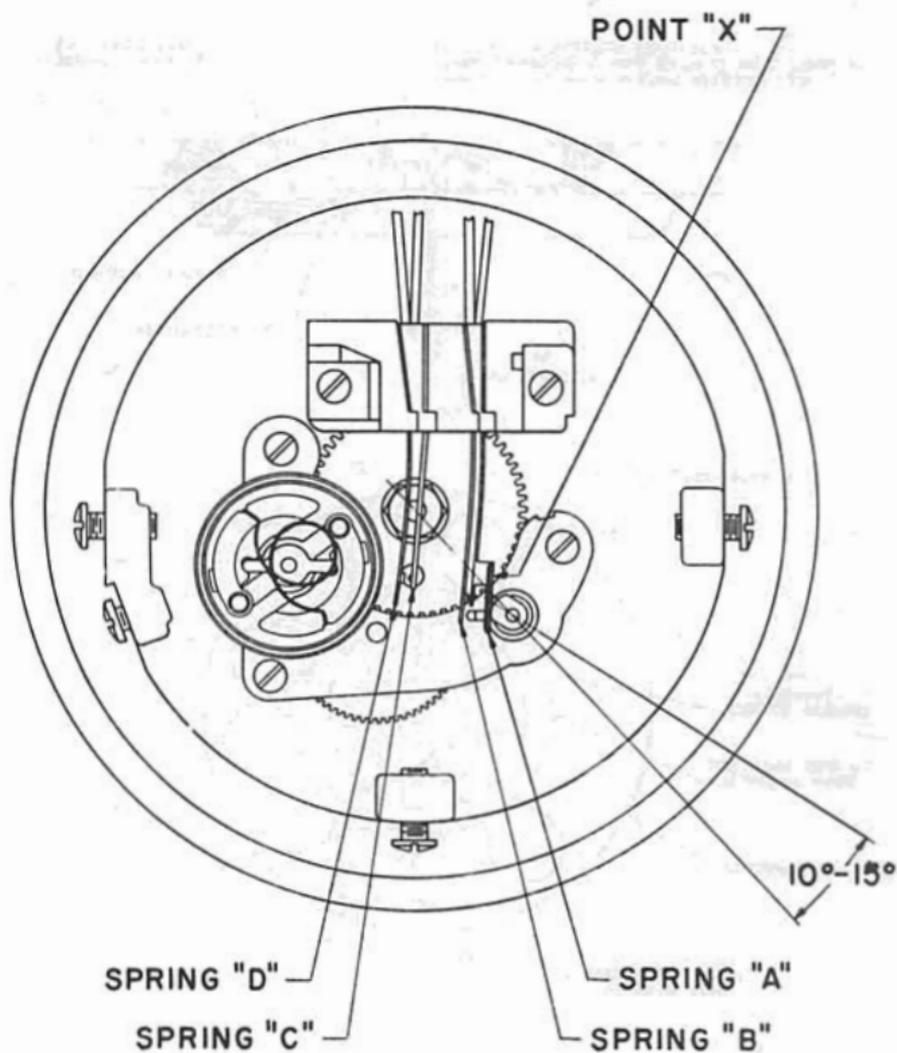


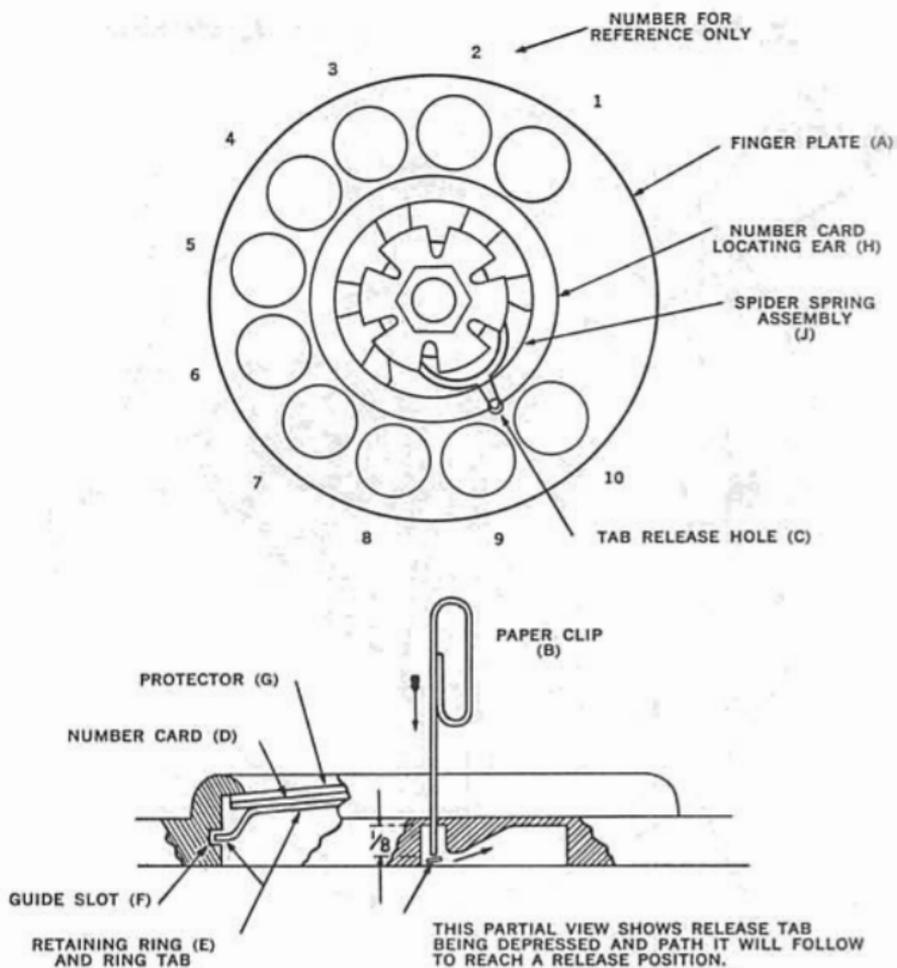
Figure No. 4

Contact Spring Arrangement

General Dial Section—K-500 Telephone

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Figure 5
LUCITE FINGER PLATE AND NUMBER CARD
ASSEMBLY INSTRUCTIONS



General Dial Section—K-500 Telephone
 Kellogg Switchboard and Supply Company, A Division of ITT Corporation

NUMBER CARD ASSEMBLY INSTRUCTIONS

A. REMOVAL OF FINGER PLATE

Revolve the Finger Plate (A) in a clockwise direction as far as it will go. Then insert one end of an opened paper clip (B) into the Tab Release Hole (C) and depress the tab approximately $\frac{1}{8}$ ". With the Locking Tab depressed, continue to turn the Finger Plate in a clockwise direction until a second stop is reached. Remove the paper clip (B) and lift the Finger Plate from the Dial.

B. REMOVAL OF NUMBER CARD

To remove the Number Card, the Finger Plate must first be removed as outlined under "A". Then turn the Finger Plate assembly over and revolve the Retaining Ring (E) until the three tabs of the ring are clear of the Guide Slots (F). Then simply lift the Ring, Card (D) and Protector (G) out of the Finger Plate.

C. ASSEMBLY OF PROTECTOR, NUMBER CARD AND RETAINING RING

Place the Protector (G) and Number Card (D) in the Finger Plate (A). Note that the notches of these parts fit into a Locating Ear (H) of the Finger Plate (A). Then place the Ring Tabs (E) in the Guide Slots (F) of the Finger Plate (A) and turn until the Ring (E) is properly seated.

D. ASSEMBLY OF FINGER PLATE (SEE NOTE)

Place the Finger Plate (A) squarely over the Spider Spring Assembly (J) on the dial with the No. 10 hole of the Finger Plate (A) directly over the center of the No. 9 dot on the Numeral Ring. Turn the Finger Plate (A) firmly in a counter-clockwise direction until the Finger Plate (A) locks in place.

NOTE Before assembling the Finger Plate on the dial, the Number Card, Protector and Retaining Ring must be assembled.

**Table I—LIST OF REPLACEMENT PARTS
19 TYPE DIAL**

Index No.	Name of Part	Part No.	Quantity
1	Dial Mounting Screw	75487 (2)	3
*2	Gasket	75474	1
3	Base Assembly	75485	1
4	Gear Train Assembly	75479	1
5	Main Gear	75475	1
6	Number Card	75415	1
7	Main Shaft	75460	1
8	Cam Casting	75449	1
9	Trigger Cam	75452	1
10	Impulse Cam	75451	1
*11	Finger Plate (Black)	75465	1
12	Finger Stop	75480	1
13	Dust Cover	75438	1
14	Main Spring	75466	1
15	Governor Spring	75461	1
16	Numeral Plate Screws	75468	3
17	Finger Stop Screw	75481	1
18	Dust Cover Screw	75576 (2)	2
19	Gear Train Screw	75576 (2)	2
20	Spring Assembly Screws	69378	2
21	Washer	60629	1
22	Washer	75453	1
23	Spring Washer	75454	1
24	Special Spring Washer	75467	1
25	Special Hex Nut	75469	1
26	Hex Nut	63986	1
27	Numeral Ring (Metropolitan)	75482 ()	1
27	Numeral Ring (Numerals Only)	75482 ()	1
28	Spring Assembly	75437	1
29	Retaining Ring	75412	1
30	Protector	75413	1
31	Retaining Disc	75416	1
32	Retaining Spring	75417	1
33	Finger Plate (Lucite)	79284	1
34	Spider Spring	79287	1
35	Gasket	75474 (2)	1
36	Retaining Disc	79291	1

*For colored dials with plastic finger plates the following applies:

- a. Replace (1) one 75474 Gasket with (1) one 75474 (2) Gasket.
- b. Replace (1) one 75418 Number Card Assembly with (1) one 80076 (1) Number Card Assembly.

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- c. Replace (1) one black 75465 Finger Plate with (1) one 79284 Finger Plate and (1) one 79287 Spider Spring Assembly.
- d. Replace (1) one black Numeral Ring with the colored Numeral Ring required as follows:

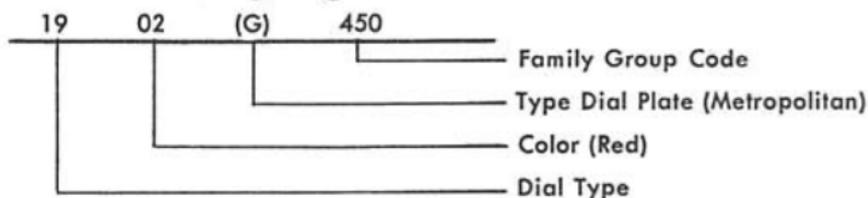
METROPOLITAN

75482 (1) (Black)	Metropolitan	
75482 (2) (Red)	75482 (7) (Beige)	75482 (12) (Aqua Blue)
75482 (3) (Brown)	75482 (8) (Gray)	75482 (13) (Light Beige)
75482 (4) (Yellow)	75482 (9) (Ivory)	75482 (14) (Light Gray)
75482 (5) (Green)	75482 (10) (Turquoise)	75482 (15) (White)
75482 (6) (Blue)	75482 (11) (Rose Pink)	

NUMERALS ONLY

75482 (21) (Black)	75482 (26) (Blue)	75482 (31) (Rose Pink)
75482 (22) (Red)	75482 (27) (Beige)	75482 (32) (Aqua Blue)
75482 (23) (Brown)	75482 (28) (Gray)	75482 (33) (Light Beige)
75482 (24) (Yellow)	75482 (29) (Ivory)	75482 (34) (Light Gray)
75482 (25) (Green)	75482 (30) (Turquoise)	75482 (35) (White)

III. Dial Coding—Figure 6



CODE NO.	SPRING ARRANGEMENT	DIAL PLATE SEE FIG.	REMARKS
19**(D)450		1	Numeral Dial.
19**(G)450		2	Metropolitan Dial.
1900(1G)450		2	Black Metropolitan Dial with lucite finger plate. Used on 50000(BA)11D Dial Light telephone.

COLOR CODE	COLORS AVAILABLE	COLOR CODE	COLORS AVAILABLE
**		08	Gray
00	Black	09	Ivory
02	Red	10	Turquoise
03	Brown	11	Rose Pink
04	Yellow	12	Aqua Blue
05	Green	13	Light Beige
06	Blue	14	Light Gray
07	Beige	15	White

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SECTION FOUR

HANDSET

General Description of Handset with Handset Cord—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

I. GENERAL DESCRIPTION OF HANDSET WITH HANDSET CORD

The handset consists of a handle which houses the receiver unit, transmitter unit, transmitter holder assembly, and the assembled handset cord. Two removable caps assemble the receiver and transmitter units. The transmitter unit has a wide frequency response and is stable in operation. Two springs in the transmitter holder assembly provide electrical connection to the transmitter.

The receiver unit consists of a ring armature receiver assembly and a varistor. The ring armature receiver consists of a domed diaphragm that is actuated at its circumference by a ring-shaped armature. This type of construction increases the receiver efficiency and frequency range.

The varistor is assembled directly to the receiver to protect the user from peak acoustical outputs and the receiver from demagnetization by abnormal transient electrical disturbances.

The short handle provides closer talking on the part of the subscriber, with consequent increased transmission. The four-conductor handset cord has a jacket that is anchored to the handle by a cord strain relief. At the base end of the cord, a clamp hook anchors the cord to the base plate.

II. MAINTENANCE

A. Inspection

1. Handset: Check the handle, transmitter and receiver caps for breaks, chips, or cracks. Make sure the transmitter and receiver caps are not loose. Clean each cap with a lint-free cloth. Check for noisy transmitter unit.

2. Handset and Mounting Cords: Check for cuts, splits, fraying or corrosion. Untwist a twisted cord. Make sure the cord strain relief bands and clamp hooks are not loose.

B. Removal and Disassembly for Replacement

1. To remove the Receiver Unit, turn the receiver cap (1) in a counter-clockwise direction. Carefully tilt the han-

General Description of Handset with Handset Cord—K-500 Telephone
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dle (10) until the receiver unit (2) slides out. Loosen the two terminal screws (3) of the receiver unit to disconnect the two terminals (9) of the Handset Cord. Upon replacement, reassemble in the reverse order.

2. To remove the Transmitter Unit turn the transmitter cap in a counter-clockwise direction. Carefully tilt the handle (10) until the transmitter unit slides out. Upon replacement, reassemble in the reverse order.

3. To remove the Transmitter Holder Assembly, remove the transmitter unit. Lift the transmitter holder assembly out of the handle (10). Disconnect the transmitter holder assembly from the two terminals (9) of the Handset Cord, by loosening the two terminal screws. Upon replacement, reassemble in the reverse order. When replacing the transmitter holder assembly in the handle (10), be sure to align the key on the rim of the assembly with the key slot in the handle.

4. To remove the handset cord, perform the disassembly procedures as explained in paragraphs 1 through 3 above. Then, with thumb and forefinger, free the cord strain relief from the anchor post at the bottom of the handle (transmitter end). Perform this operation carefully to avoid damaging the cord strain relief or the anchor post. Do not use long-nose pliers or a screwdriver. After freeing the cord strain relief, carefully pull the cord through the hole at the transmitter end of the handle (10). Be careful not to damage the two receiver terminals as they are pulled through the core of the handle. To remove the handset cord from the base, remove the base assembly from the housing-plunger assembly by loosening the two cabinet lock screws at each end of the base plate. Release the cord clamp hook from the anchor hole in the rim of the base plate. Disconnect the four terminals from the network assembly by loosening the four terminal screws. Carefully pull the conductors through the space between the cradle switch assembly and the dial. Upon replacement, reassemble in the reverse order. When replacing the handset cord at the handset, pull the receiver terminals through the core of the handle.

General Description of Handset with Handset Cord—K-500 Telephone
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III. HANDSET AND HANDSET CORD CODES

TABLE 1

HANDSET CODE NO.	HANDSET CORD CODE NO.	REMARKS
6500(C)410	3030()650	4 Conductor Black Straight Cord for 500 Type Telephone
6500(C2)410	100500(07)650	4 Conductor Black Coiled Cord for 500 Type Telephone
65**(C2)410	1005**(07)650	4 Conductor Coiled Cord for Colored 500 Type Telephone

TABLE 2

RECEIVER CAP PART NO.	TRANSMITTER CAP PART NO.	HANDLE PART NO.	REMARKS
75381	75380	75383	Black Bakelite
79289 (*)	79290 (*)	79250 (*)	Tenite or Forticel

Coded Items	Color	Piece Part Suffix
* *		(*)
02	Red	2
03	Brown	3
04	Yellow	4
05	Green	5
06	Blue	6
07	Beige	7
08	Gray	8
09	Ivory	9
10	Turquoise	10
11	Rose Pink	11
12	Aqua Blue	12
13	Light Beige	13
14	Light Gray	14
15	White	15

General Description of Handset with Handset Cord—K-500 Telephone Kellogg Switchboard and Supply Company, A Division of ITT Corporation

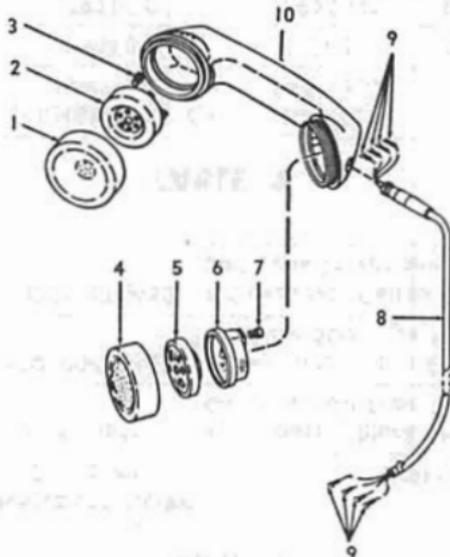
LIST OF REPLACEMENT PARTS

(SEE FIG. 1)

TABLE 3

INDEX NO.	NAME OF PART	PART NO.	QUANTITY
1	Receiver Cap	See Table 2	1
2	Receiver Unit	75547	1
3	Terminal Screw	75386	2
4	Transmitter Cap	See Table 2	1
5	Transmitter Unit	75555	1
6	Transmitter Holder Assembly	75384	1
7	Terminal Screw	75386	2
8	Handset Cord	See Table 1	1
9	Terminal	75325	8
10	Handle	See Table 2	1

FIG. 1
EXPLODED VIEW—HANDSET
CODE NO's. 6500(C)410, 6500(C2)410



General Description of Handset with Handset Cord—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

SECTION FIVE

RINGER

General Ringer Section—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

I. GENERAL RINGER DESCRIPTION

A. High Impedance Ringers

The ringer used in the Code 500 telephone is a new, single-coil design with a higher impedance, allowing more ringers to be placed on a line with no increase in bridging loss, or increase of unbalance on divided ringing circuits. With volume control, the subscriber may adjust the sound output over a range of approximately 4 db. with the highest value of about 2 db. above previous ringers. The two gongs have harmonically related frequencies whose fundamentals are reinforced by resonant air chambers below the gongs, which equals about 15 db. gain in sound output.

The magnetic circuits include a laminated coil core, pole pieces, armature, permanent magnet and magnetic shunt. These provide adequate sensitivity to ringing signals and low sensitivity to transients or other operating surges. The structure design includes the magnetic circuit saturation feature, to limit the effects of high surge currents which might otherwise weaken the permanent magnet.

1. Biased Ringer

The Code 130(BA)470 ringer consists of a coil with a laminated core, magnetic circuit assembly (or support pole piece assembly), a permanent magnet, clapper assembly, and two brass gongs and their resonators. The entire assembly is mounted on a frame which is secured to the base plate by two removable screws. The clapper assembly consists of an adjustable biasing spring wire, a damper rod, and a rod and weight that strikes the two gongs. An adjustable control wheel extends through the base plate. When the control wheel is rotated, the distance between the gongs and clapper weight is varied, permitting adjustment of the ringer volume. In addition, a detent spring, mounted on the same shaft with the wheel, provides controlled adjustment of the volume level. However, a stop on the detent spring prevents reducing the volume below a minimum level. The stop may be disabled to provide ringer cutoff service. For bias adjustment, the bias

spring on the clapper assembly can be shifted to a high or low position. Normally the spring is in the high position.

2. Frequency Selective Ringers

Frequency selective ringers may be installed to provide frequency selective ringing service. The frequency selective ringer consists of a coil with a laminated core which is mounted on a core-slide assembly, a shunt bar, magnet, armature, clapper assembly, reed and two brass gongs and their resonators. The entire assembly is mounted on a frame which is secured to the base plate by two removable screws. Ringer gaps, if necessary, may be controlled by means of an adjustment screw.

The ringer may be supplied with or without a volume control. See Tables 2 and 4, Pages 60 and 63.

B. Ringing Services

The Code 500 type telephone set is an anti-sidetone set that may be used for all classes of common battery manual or dial subscribers' services. Since the types and methods of ringing are variable in common battery systems, facilities are provided in the telephone set for the following ringing services:

1. Biased Ringers (non-polarized)

- a. Individual lines.
- b. Two-party selective divided lines.
- c. Two-party selective message rate lines.
- d. Two-party selective automatic ticketing lines.
- e. Four-party semi-selective divided lines.
- f. Code ringing non-selective bridge or divided party lines.

2. Frequency Selective Ringers

- a. One to five selective bridged party lines.
- b. One to ten selective divided party lines.
- c. Six to ten semi-selective bridged party lines.
- d. Eleven to twenty semi-selective divided party lines.

II. INSTALLATION

A. Ringer Code and List of Replacement Parts

1. Biased Ringer with volume control.

a.	Code No.	Capacitor	Remarks
	130(BA)470	*	Contains concentric wound coil. Inside winding has 1000 ohms resistance. Outside winding has 2650 ohms resistance.

*Denotes .47 mfd internal capacitor provided in the network.

- b. Parts List—Table 1, page 58.
- c. Exploded view—Fig. 1, page 58.
- d. Outline view—Fig. 2, page 59.
- e. Adjustment of Stop Tab—Fig. 3, Page 59.
2. Frequency Selective Ringer with volume control.
 - a. Code 131 and E131 type Ringers—Table 2, page 60.
 - b. Parts List—Table 3, page 61.
 - c. Exploded view—Fig. 4, page 62.
3. Frequency Selective Ringer without volume control.
 - a. Code 133 and E133 type Ringers—Table 4, page 63.
 - b. Parts List—Table 3, page 61, less item 13, Damper Spring Assembly 75580.
 - c. Exploded view—Fig. 4, page 62, less item 13.

B. Ringer Connections

The connections at the connecting block and terminal board of the network assembly will depend upon the type of ringing (biased or frequency selective) and ringing service. The following circuit labels, pages 67-93, as listed in Table 5, page 64 [Code 130(BA)470 Biased Ringers], and Table 6, page 65 [Codes 131, E131, 133, and E133 type Frequency Selective Ringers], specify ringer connections and ringing service information for specific telephones.

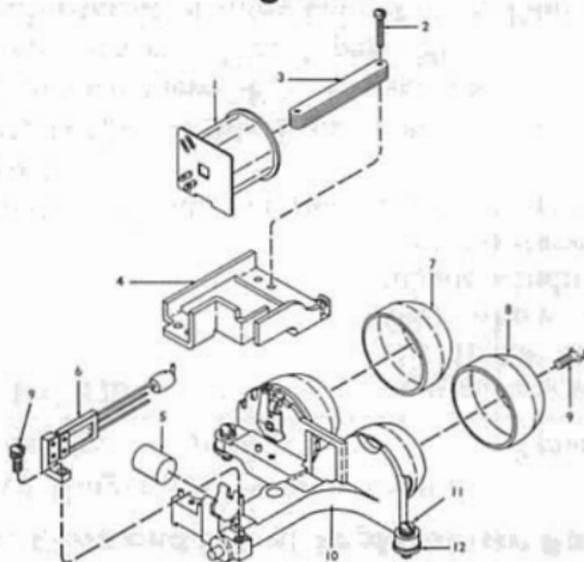
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TABLE 1
LIST OF REPLACEMENT PARTS
FOR
CODE 130(BA)470 RINGER

INDEX NO.	NAME OF PART	PART. NO	QUANTITY
1	Coil Assembly	75442	1
2	Flat Fil. Hd. Machine Screw	75409 (2)	2
3	Core Lamination	75395	1
4	Support Pole Piece Assembly	75398	1
5	Magnet	75369	1
6	Clapper Assembly	75393	1
7	Gong (Movable)	75396	1
8	Gong (Fixed)	75397	1
9	RH Lockwasher Screw	75408 (2)	3
10	Frame Assembly	75388	1
11	Mounting Screw Assembly	75366	1
12	Rubber Foot	75371	1

EXPLODED VIEW—CODE 130(BA)470 RINGER

Figure 1



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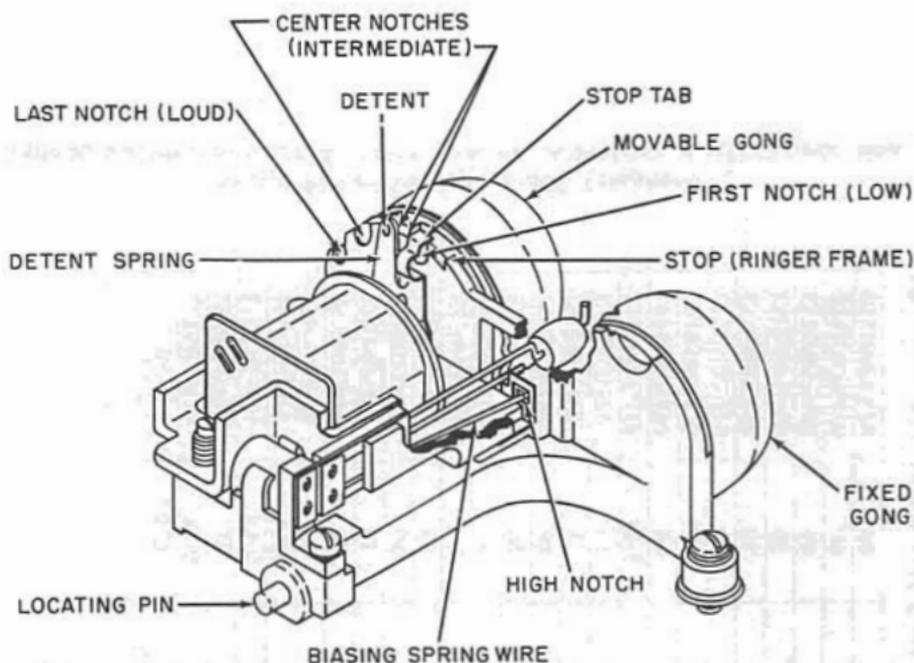


Figure 2

Code 130(BA)470 Ringer

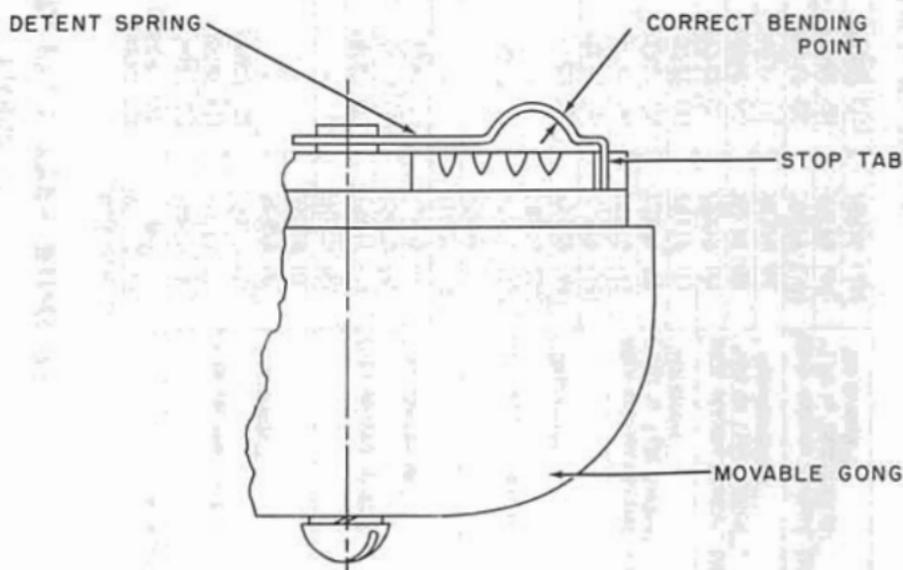


Figure 3

Adjustment of Stop Tab on Detent Spring of Code 130(BA)470 Ringer

General Ringer Section—K-500 Telephone
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TABLE 2
131 AND E131 TYPE RINGERS

CODE NO.	FREQ.	CAPACITOR SIZE	CAPACITOR ASSEM. NO.	ARMATURE & WT. ASSEM. NO.	REMARKS
131(HA1)470	33½	.35 mfd	75583 (3)	75579 (1)	With volume control. "Harmonic"
131(HA2)470	50	.10 mfd	75583 (1)	75579 (2)	
131(HA3)470	66½	.10 mfd	75583 (1)	75579 (3)	
131(HA4)470	16½	"	"	75579 (4)	
131(HA5)470	25	"	"	75579 (5)	
131(HB1)470	30	"	"	75579 (6)	With volume control. "Synchronomic"
131(HB2)470	42	.25 mfd	75583 (2)	75579 (7)	
131(HB3)470	54	.10 mfd	75583 (1)	75579 (8)	
131(HB4)470	66	.10 mfd	75583 (1)	75579 (9)	
131(HB5)470	16	"	"	75579 (10)	
131(HC1)470	20	"	"	75579 (11)	With volume control. "Decimonic"
131(HC2)470	60	.10 mfd	75583 (1)	75579 (12)	
131(HC3)470	30	"	"	75579 (13)	
131(HC4)470	40	.25 mfd	75583 (2)	75579 (14)	
131(HC5)470	50	.10 mfd	75583 (1)	75579 (15)	
E131(HA1)470	33½	.35 mfd	79742 (3)	75579 (1)	With volume control. Used on tel. with "Lift to Talk Switch". "Harmonic"
E131(HA2)470	50	.10 mfd	79742 (1)	75579 (2)	
E131(HA3)470	66½	.10 mfd	79742 (1)	75579 (3)	
E131(HB2)470	42	.25 mfd	79742 (2)	75579 (7)	With volume control. Used on tel. with "Lift to Talk Switch". "Synchronomic"
E131(HB3)470	54	.10 mfd	79742 (1)	75579 (8)	
E131(HB4)470	66	.10 mfd	79742 (1)	75579 (9)	
E131(HC2)470	60	.10 mfd	79742 (1)	75579 (12)	With volume control. Used on tel. with "Lift to Talk Switch". "Decimonic"
E131(HC4)470	40	.25 mfd	79742 (2)	75579 (14)	
E131(HC5)470	50	.10 mfd	79742 (1)	75579 (15)	

*Denotes .47 mfd Internal Capacitor Provided in the Network.

TABLE 3
LIST OF REPLACEMENT PARTS FOR
CODES 131 AND 133 TYPE RINGERS
(SEE FIGURE 4)

INDEX NO.	NAME OF PART	PART NO.	QUANTITY
1	Gong "A"	75396	1
2	Gong "B"	75397	1
3	Gong Mounting Screw	75408 (2)	2
4	Ringer Mounting Screw	75366	2
5	Mounting Frame	75577	1
6	Slide Plate & Lamination Assembly	75578	1
7	Magnet	75562	1
8	Clamping Plate	75563	1
9	Clamping Plate	75564	1
10	Shunt Bar	75566	1
11	Control Wheel & Resonator Assembly	75581 (1)	1
12	Control Wheel & Resonator Assembly	75581 (2)	1
13	Damper Spring Assembly	75580	1 *
14	Armature & Weight Assembly	See Table 2 or 4	1
15	Coil Assembly	75582	1
16	Jumper Wire Assembly	75326 (38)	1 **
17	Capacitor & Bracket Assembly	See Table 2 or 4	1 ***
18	Armature Mounting Screw	79260 (2)	2
19	Control Wheel Mounting Screw	79258 (2)	2
20	Shunt Bar & Slide Plate Screw	79259 (2)	3
21	Magnet Clamp Screw	79260 (3)	2
22	Eccentric Stud	75560	1
23	Retaining Ring	75586 (2)	1
24	Washer	4532	1
25	Washer	63990	2
26	Washer	64197	1

*Code 131 Type Ringers only.

**Furnished with ringer only when internal capacitor is used.

***Furnished with ringer only when external capacitor is required.

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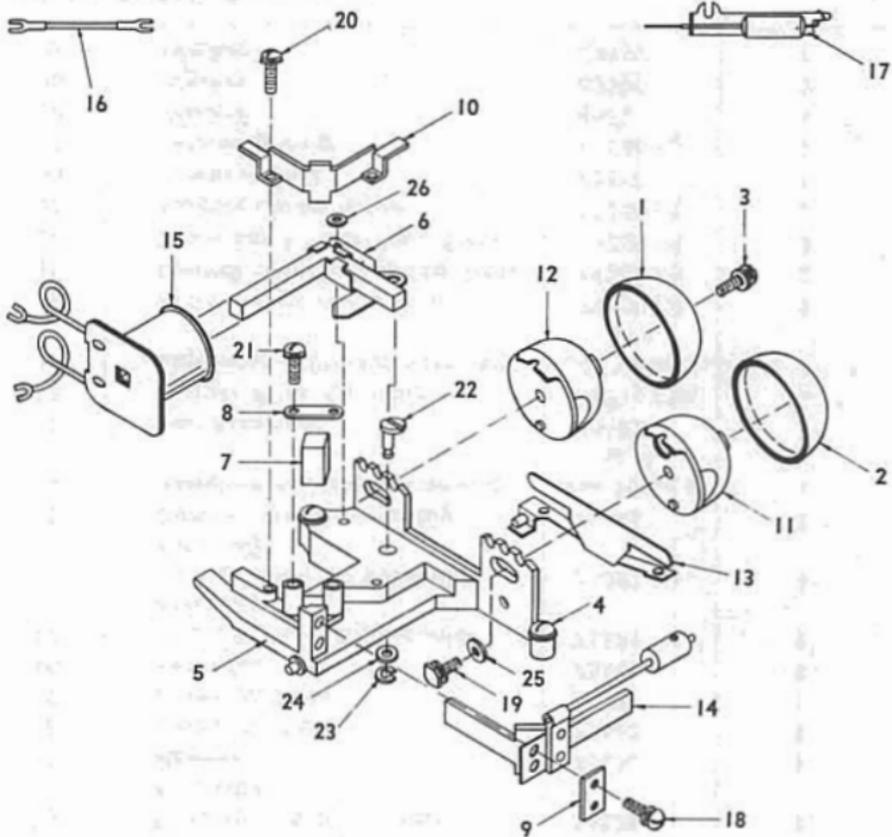


Figure 4
EXPLODED VIEW—CODES 131 AND 133 TYPE
RINGERS

General Ringer Section—K-500 Telephone
 Kellogg Switchboard and Supply Company, A Division of ITT Corporation

TABLE 4
133 AND E133 TYPE RINGERS

CODE NO.	FREQ.	CAPACITOR SIZE	CAPACITOR ASSEM. NO.	ARMATURE & WT. ASSEM. NO.	REMARKS
133(HA1)470	33½	.35 mfd	75583 (3)	75579 (1)	Less volume control. "Harmonic"
133(HA2)470	50	.10 mfd	75583 (1)	75579 (2)	
133(HA3)470	66⅔	.10 mfd	75583 (1)	75579 (3)	
133(HA4)470	16⅔	°	°	75579 (4)	
133(HA5)470	25	°	°	75579 (5)	
133(HB1)470	30	°	°	75579 (6)	Less volume control. "Synchronomic"
133(HB2)470	42	.25 mfd	75583 (2)	75579 (7)	
133(HB3)470	54	.10 mfd	75583 (1)	75579 (8)	
133(HB4)470	66	.10 mfd	75583 (1)	75579 (9)	
133(HB5)470	16	°	°	75579 (10)	
133(HC1)470	20	°	°	75579 (11)	Less volume control. "Decimonic"
133(HC2)470	60	.10 mfd	75583 (1)	75579 (12)	
133(HC3)470	30	°	°	75579 (13)	
133(HC4)470	40	.25 mfd	75583 (2)	75579 (14)	
133(HC5)470	50	.10 mfd	75583 (1)	75579 (15)	
E133(HA1)470	33½	.35 mfd	79742 (3)	75579 (1)	Less volume control. For Tel. with "Lift to Talk Switch." "Harmonic"
E133(HA2)470	50	.10 mfd	79742 (1)	75579 (2)	
E133(HA3)470	66⅔	.10 mfd	79742 (1)	75579 (3)	
E133(HB2)470	42	.25 mfd	79742 (2)	75579 (7)	Less volume control. For Tel. with "Lift to Talk Switch". "Synchronomic"
E133(HB3)470	54	.10 mfd	79742 (1)	75579 (8)	
E133(HB4)470	66	.10 mfd	79742 (1)	75579 (9)	
E133(HC2)470	60	.10 mfd	79742 (1)	75579 (12)	Less volume control. For Tel. with "Lift to Talk Switch". "Decimonic"
E133(HC4)470	40	.25 mfd	79742 (2)	75579 (14)	
E133(HC5)470	50	.10 mfd	79742 (1)	75579 (15)	

* Denotes .47 mfd Internal Capacitor Provided in the Network.

WIRING CONNECTIONS FOR BIASED RINGERS
TABLE 5

CODE NO.	CIRCUIT NO.	PAGE NO.	REMARKS AND SPECIAL FEATURES
130(BA)470	21531	67	Ringer Volume Control.
130(BA)470	21542	71	Ringer Volume Control. Push Button.
130(BA)470	21551	85	Ringer Volume Control. Lift-to-Talk Switch.
130(BA)470	21550	83	Ringer Volume Control. Dial Light. 6 Conductor Mounting Cord.
130(BA)470	21556	89	Ringer Volume Control. 79857 Push-Key Assembly. Used with 1-14()851 Repeater.
130(BA)470	21535	69	Ringer Volume Control. Vacuum Tube.
130(BA)470	21549	81	Ringer Volume Control. Vacuum Tube. Lift-to-Talk Switch.
130(BA)470	21548	79	Ringer Volume Control. Exclusion Switch. 6 Conductor Mounting Cord.
130(BA)470	21543	73	Ringer Volume Control. Turn key. 4 Conductor Mounting Cord.
130(BA)470	21543	73	Ringer Volume Control. Turn key. 6 Conductor Mounting Cord.
130(BA)470	21544	75	Ringer Volume Control. Key System Tel. K588(B)740 Key. 79523 Lamp Strip Assembly. 19 Conductor Mounting Cord.
130(BA)470	21545	77	Ringer Volume Control. Key System Tel. K589(B)740 Key. 79524 Lamp Strip Assembly. 34 Conductor Mounting Cord.
130(BA)470	21554	87	Ringer Volume Control. Key System Tel. K589(B)740 Key. 79524 Lamp Strip Assembly. Exclusion Switch. 34 Conductor Mounting Cord.

WIRING CONNECTIONS FOR FREQUENCY SELECTIVE RINGERS

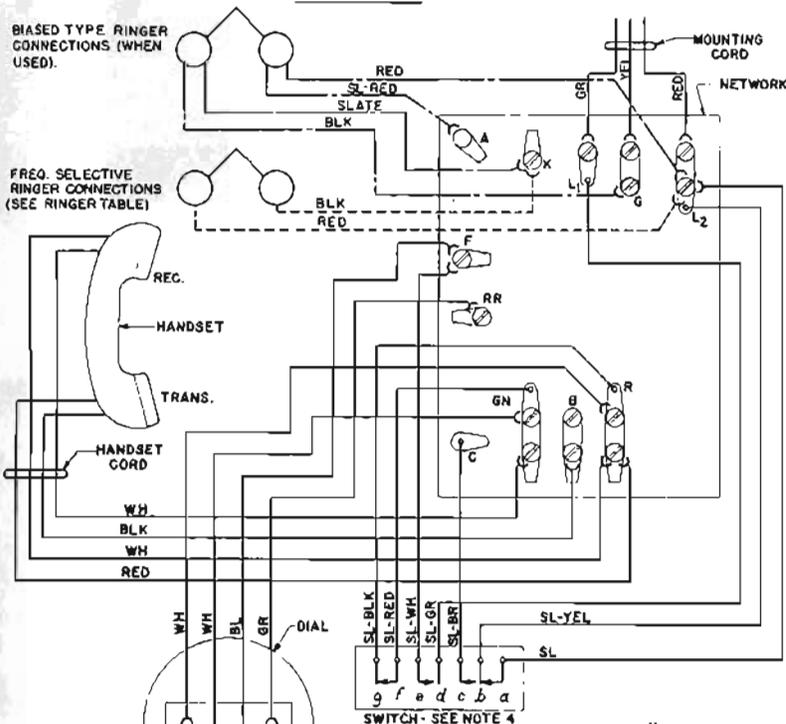
TABLE 6

CODE NO.	CIRCUIT NO.	PAGE NO.	REMARKS AND SPECIAL FEATURES
131(HA1 to 5)470	21531	67	Ringer Volume Control.
133(HA1 to 5)470	21531	67	Less Ringer Volume Control.
E131(HA1,2,3)470 & 131(HA4,5)470	21551	85	Ringer Volume Control. Lift-to-Talk Switch.
E133(HA1,2,3)470 & 133(HA4,5)470	21551	85	Less Ringer Volume Control. Lift-to-Talk Switch.
131(HB1 to 5)470	21531	67	Ringer Volume Control.
133(HB1 to 5)470	21531	67	Less Ringer Volume Control.
131(HB1,5)470 & E131(HB2,3,4)470	21551	85	Ringer Volume Control. Lift-to-Talk Switch.
133(HB1,5)470 & E133(HB2,3,4)470	21551	85	Less Ringer Volume Control. Lift-to-Talk Switch.
131(HC1 to 5)470	21531	67	Ringer Volume Control.
133(HC1 to 5)470	21531	67	Less Ringer Volume Control.
131(HC1,3)470 & E131(HC2,4,5)470	21551	85	Ringer Volume Control. Lift-to-Talk Switch.
133(HC1,3)470 & E133(HC2,4,5)470	21551	85	Less Ringer Volume Control. Lift-to-Talk Switch.
E131(HA1,2,3)470 & 131(HA4,5)470	21563	91	Ringer Volume Control. Exclusion Switch. 6 Conductor Mounting Cord.
E133(HA1,2,3)470 & 133(HA4,5)470	21563	91	Less Ringer Volume Control. Exclusion Switch. 6 Conductor Mounting Cord.
E131(HB2,3,4)470 & 131(HB1,5)470	21563	91	Ringer Volume Control. Exclusion Switch. 6 Conductor Mounting Cord.
E133(HB2,3,4)470 & 133(HB1,5)470	21563	91	Less Ringer Volume Control. Exclusion Switch. 6 Conductor Mounting Cord.
E131(HC2,4,5)470 131(HC1,3)470	21563	91	Ringer Volume Control. Exclusion Switch. 6 Conductor Mounting Cord.
E133(HC2,4,5)470 & 133(HC1,3)470	21563	91	Less Ringer Volume Control. Exclusion Switch. 6 Conductor Mounting Cord.
131(HA1 to 5)470	21564	93	Ringer Volume Control. Turn Key. 4 Conductor Mounting Cord.
133HA1 to 5)470	21564	93	Less Ringer Volume Control. Turn Key. 4 Conductor Mounting Cord.
131(HB1 to 5)470	21564	93	Ringer Volume Control. Turn Key. 4 Conductor Mounting Cord.
133(HB1 to 5)470	21564	93	Less Ringer Volume Control. Turn Key. 4 Conductor Mounting Cord.
131(HC1 to 5)470	21564	93	Ringer Volume Control. Turn Key. 4 Conductor Mounting Cord.
133(HC1 to 5)470	21564	93	Less Ringer Volume Control. Turn Key. 4 Conductor Mounting Cord.

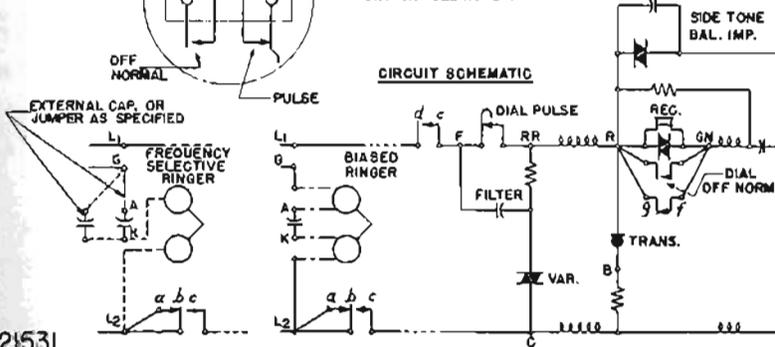
General Ringer Section—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

K-500 TYPE TELEPHONE CIRCUIT

WIRING DIAGRAM



CIRCUIT SCHEMATIC



CLASS OF SERVICE	TABLE OF CONNECTIONS (BIASED RINGERS) (SEE NOTES 1 TO 4)												
	CONNECTIONS AT CONNECTING BLOCK						CONNECTIONS AT NETWORK						
	LINE	MTG. CORD			MTG. CORD			RINGER LEADS					
	RING	TIP	GRD.	RED	GR	YEL	RED	GR	YEL	RED	BLK	SL	SL-RED
BRIDGED Δ	R	G	Y	R	G	Y	L ₂	L ₁	G	L ₂	G	K	A
RING PARTY Δ	R	G	Y	R	G	Y	L ₂	L ₁	G	L ₂	G	K	A
TIP PARTY EXCEPT DIAL MESSAGE RATE	R	G	Y	G	R	Y	L ₂	L ₁	G	L ₂	G	K	A
TIP PARTY DIAL MESSAGE RATE *	R	G	Y	G	R	Y	L ₂	L ₁	G	K	G	B	B
AUTOMATIC TICKETING *	R	G	Y	G	R	Y	L ₂	L ₁	G	B	B	K	G

Δ CONNECTIONS FOR BRIDGED AND RING PARTIES ARE FOR FLAT AND MESSAGE RATE SERVICE.

* TRANSFER SLATE SWITCH LEAD FROM (L₂) TO (A) TERMINAL ON NETWORK.

NOTES:

1. FOR MANUAL SERVICE: REPLACE DIAL WITH DUMMY PLUG ASSEMBLY AND TRANSFER SLATE-WHITE SWITCH LEAD TO (RR) TERMINAL ON NETWORK.
2. TO PERMANENTLY SILENCE RINGER: FOR BRIDGED, RING PARTY AND TIP PARTY EXCEPT DIAL MESSAGE RATE SERVICES, TRANSFER BLACK RINGER LEAD TO (A) TERMINAL ON NETWORK. FOR TIP PARTY DIAL MESSAGE RATE SERVICE, TRANSFER SLATE-RED RINGER LEAD TO THE (K) TERMINAL, BLACK LEAD TO (B) AND SLATE LEAD TO (B) MUST REMAIN CONNECTED FOR PARTY IDENTIFICATION. FOR AUTOMATIC TICKETING, TRANSFER BLACK RINGER LEAD TO THE (K) TERMINAL.
3. RINGER CUT-OFF CONTROL BY CUSTOMER: BEND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE RIM OF THE RINGER FRAME. THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT.
4. WHEN THE HANDSET IS REMOVED CONTACT *g* BREAKS LAST.

TABLE OF RINGERS

FREQUENCY SELECTIVE (HARMONIC) TYPES	CY	PTY.	μF	CONNECTIONS IN SET.
HA 1	33 1/3	1	35	SEE NOTE 5
HA 2	50	2	1	5
HA 3	66 2/3	3	1	5
HA 4	162 1/3	4	-	6
HA 5	25	5	-	6
HB 1	30	1	-	6
HB 2	42	2	25	5
HB 3	54	3	1	5
HB 4	66	4	1	5
HB 6	16	5	-	6
HC 1	20	1	-	6
HC 2	30	2	1	5
HC 3	60	3	-	6
HC 4	40	4	25	5
HC 5	50	5	1	5

NOTES:

5. MOUNT THE CONDENSER FURNISHED ON THE "K" TERMINAL OF THE NETWORK. CONNECT THE LOOSE CONDENSER LEAD TO THE "G" TERMINAL.
6. CONNECT JUMPER FROM "A" TO "G" ON THE NETWORK.

CONNECTIONS FOR FREQUENCY SELECTIVE RINGERS

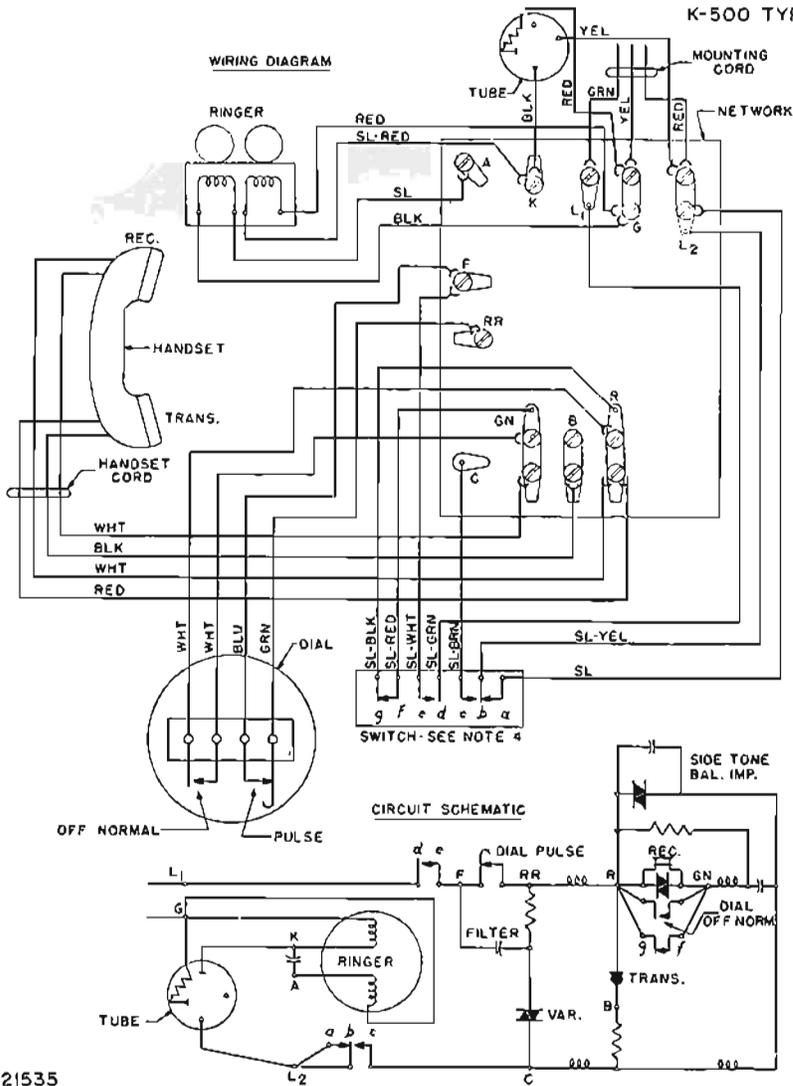
RINGING SERVICE	CONNECTIONS AT CONNECTING BLOCK						CONN. IN SET (ALSO SEE TABLE OF RINGERS)					
	LINE			MTG. CORD			RINGER LEADS			RINGER LEADS		
	RING	TIP	GRD.	GR	YEL	RED	RED	BLK	SL	SL-RED		
BRIDGED	R	G	Y	R	G	Y	L ₂	L ₁	G	L ₂	G	K
RING PARTY	R	G	Y	R	G	Y	L ₂	L ₁	G	L ₂	G	K
TIP PARTY	R	G	Y	G	R	Y	L ₂	L ₁	G	L ₂	G	K

* IF GROUND WIRE IS BROUGHT TO CONNECTING BLOCK

General Ringer Section—K-500 Telephone

Kelllogg Switchboard and Supply Company, A Division of ITT Corporation

K-500 TYPE TELEPHONE CIRCUIT



CLASS OF SERVICE	TABLE OF CONNECTIONS (POLARIZED RINGING)															
	CONNECTIONS AT CONNECTING BLOCK					CONNECTIONS AT NETWORK										
	LINE	MTG. CORD		TUBE LEADS		RINGER LEADS			SL. LEADS							
RING	TIP	GRD.	RED	GRN	YEL	YEL	BLK	RED	RED	BLK	SL	SL	SL	SL	RED	
(-) RING	R	G	Y	R	G	Y	L2	K	G	G	A	K				
(+) RING	R	G	Y	R	G	Y	G	K	L2	L2	L2	A	K			
(-) TIP	R	G	Y	G	R	Y	L2	K	G	G	G	A	K			
(+) TIP	R	G	Y	G	R	Y	G	K	L2	L2	L2	A	K			

NOTES:

1. FOR MANUAL SERVICE:
REPLACE DIAL WITH DUMMY PLUG ASSEMBLY AND TRANSFER SLATE-WHITE SWITCH LEAD TO (RR) TERMINAL ON NETWORK.
2. TO PERMANENTLY SILENCE RINGER:
FOR RING PARTY, CONNECT THE YELLOW MOUNTING CORD CONDUCTOR TO THE (R) TERMINAL OF THE CONNECTING BLOCK. FOR TIP PARTY, CONNECT THE YELLOW MOUNTING CORD CONDUCTOR TO THE (G) TERMINAL OF THE CONNECTING BLOCK.
3. RINGER CUT-OFF CONTROL BY CUSTOMER:
BEND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE RIM OF THE RINGER FRAME. THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT.
4. WHEN THE HANDSET IS REMOVED CONTACT *gf* BREAKS LAST.

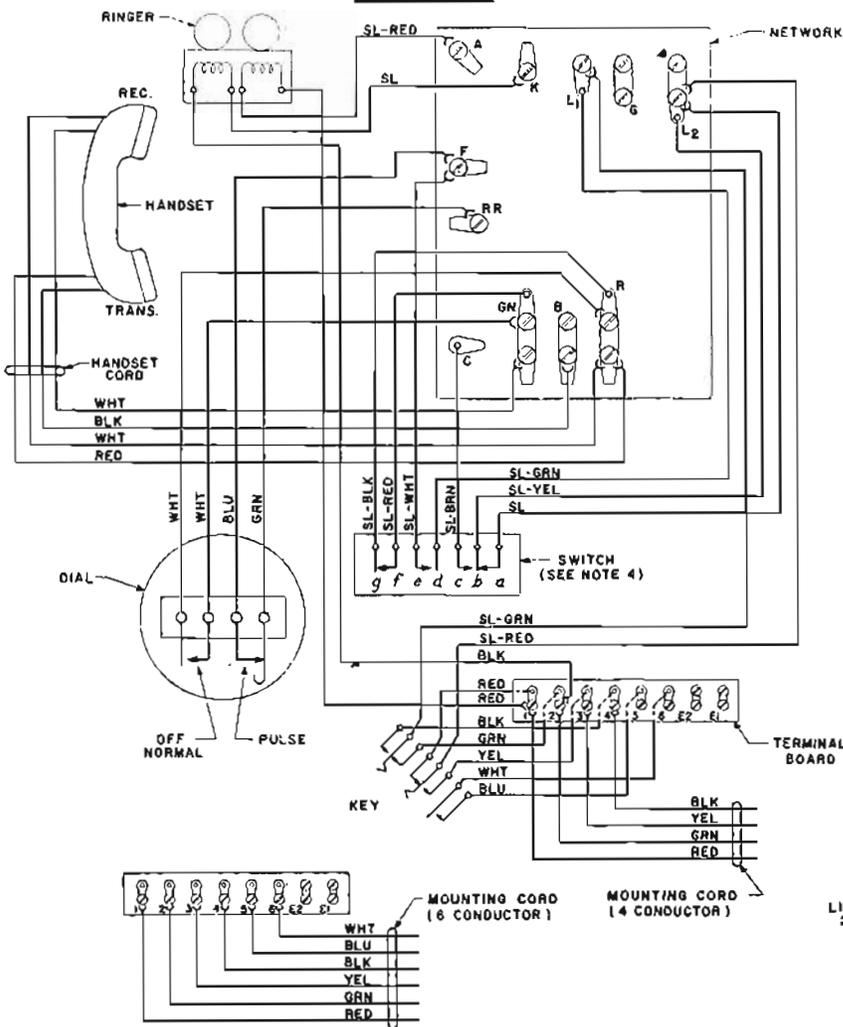
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General Ringer Section—K-500 Telephone

Kellogg Switchboard and Supply Company, A Division of ITT Corporation

K-510 TYPE TELEPHONE CIRCUIT

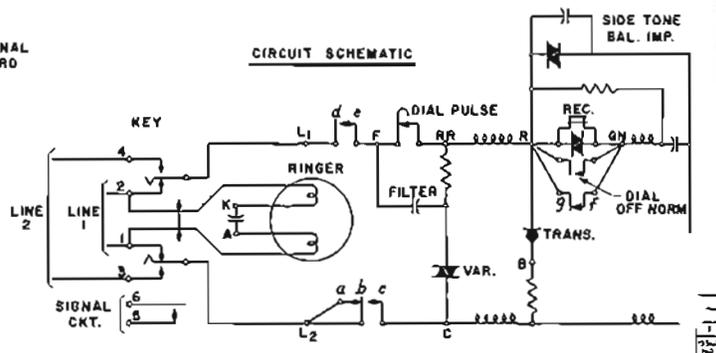
WIRING DIAGRAM



NOTES:

1. FOR MANUAL SERVICE:
REPLACE DIAL WITH DUMMY PLUG ASSEMBLY AND TRANSFER SLATE-WHITE SWITCH LEAD TO (RR) TERMINAL ON NETWORK.
2. TO PERMANENTLY SILENCE RINGER:
TRANSFER BLACK RINGER LEAD TO (K) TERMINAL ON NETWORK.
3. RINGER CUT-OFF CONTROL BY CUSTOMER:
BEND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE RIM OF THE RINGER FRAME. THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT.
4. WHEN THE HANDSET IS REMOVED FROM CRADLE CONTACT g BREAKS LAST.

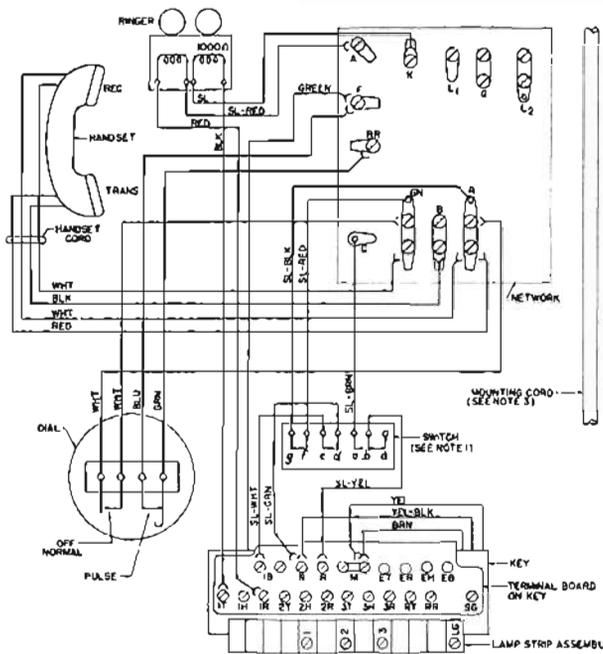
CIRCUIT SCHEMATIC



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General Ringer Section—K-500 Telephone

Kellogg Switchboard and Supply Company, A Division of ITT Corporation



- NOTES**
- CONTACT SEQUENCE REMOVING HANDSET
 A- CO CLOSURES BEFORE CO
 B- FG OPENS
 RESTORING HANDSET
 A- FG CLOSURES
 B- CO OPENS BEFORE CO
 - FOR MANUAL SERVICE, REPLACE DIAL WITH DUMMY PLUG ASSY AND TRANSFER GREEN KEY LEAD FROM (F) TERMINAL TO (AR) TERMINAL ON NETWORK
 - SEE TABLE FOR CONNECTIONS
 - RINGER CUT-OFF CONTROL BY CUSTOMER BEHND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE RIM OF THE RING FRAME THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT
 - KEY FEATURE DESIGNATIONS
 W- HOLD
 P- PICK-UP
 S- SIGNAL
 P- CONVERTIBLE PICK-UP OR SIGNAL
 B- DD- CONDUCTORS ARE TAPED AND STORED IN TELEPHONE
 - PROVIDE "M" WIRING WHEN BUZZER IS TO OPERATE ON 60 CYCLES AC, AND PROVIDE "N" WIRING WHEN THE BUZZER IS TO OPERATE ON DC

TABLE A
UNIVERSAL-RING SYSTEM CONVERSION-STATION BUSY SIGNAL CONNECTIONS
CONNECTION OF HOLD KEY AND SWITCH LEADS

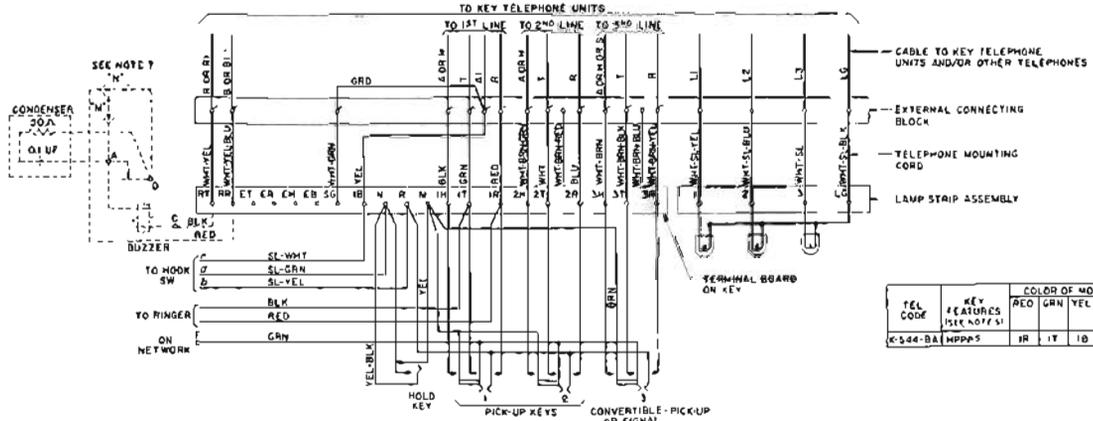
	KEY TEL. SIS		HOLD KEY AND SWITCH LEADS			
	SL-WHT	IB	SL-GRN	SL-YEL	YEL	YEL-BLK
NO STATION BUSY LAMP	UNWV	IB	IB	M	R	M
	MAV	IB	N	R	W	M

TABLE B
RINGER CONNECTIONS

	WHEN USED AS BRIDGED RINGER ON ANY LINE	RINGER OR BUZZER LEAD			
		SL-RED	SL	BLK	RED
SET RINGER OR BUZZER NOT TO BE CUT OFF IN SET	WITH CONDO	A	K	T	R
	WHEN USED AS PRIVATE LINE COMMON SIGNAL OR OTHER USE WITHOUT CONDO	A	A	RT	RR

TABLE C
PICK-UP - SIGNALING CONVERSION
CONVERT FROM LOCKING TO NON-LOCKING OR VICE-VERSA AND CHANGE LEADS AS FOLLOWS

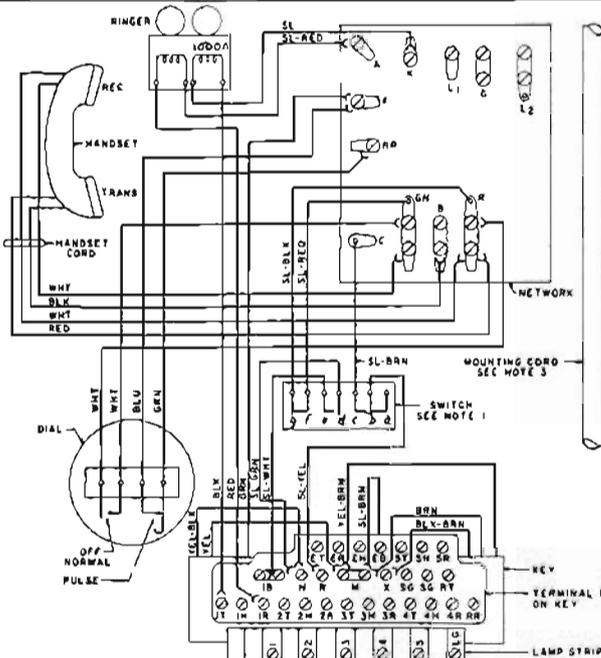
	NO OF PICK-UP KEYS	NO OF SIG KEYS CONVERTED FROM PU KEYS	NO OF PRIVATE AND INTERCOMMUNICATING LINES WITH COMMON SIG. KEY	KEY LEADS			
				YEL-BRN	BRN	SL-BRN	BLK-BRN
4 BUTTON SETS	3			W			
	2	1		SG			



COLOR OF MOUNTING CORD CONDUCTORS TO TERMINALS ON KEY AND LAMP TERMINAL STRIP

TEL CODE	KEY FEATURES (SEE NOTE 1)	RED	GRN	YEL	BLK	BLU	WHT	WHT-WHT												
K-544-BA-MPPPS		IR	IT	IB	IH	IR	IT	DD	2H	3R	3Y	3D	3W	DR	RT	SG	LG	1	2	3

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- NOTES**
- CONTACT SEQUENCE REMOVING HANDSET
A d₂ CLOSSES BEFORE c₂
B f₂ OPENS
RESTORING HANDSET
A f₂ CLOSSES
A c₂ OPENS BEFORE d₂
 - FOR MANUAL SERVICE REPLACE DIAL WITH DUMMY PLUG ASSEMBLY AND TRANSFER GREEN KEY LEAD FROM (7) TERMINAL TO (17) TERMINAL ON NETWORK
 - SEE TABLE FOR CONNECTIONS
 - FOR RINGER CUT-OFF CONTROL BY CUSTOMER BEND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE ARM OF THE RINGER FRAME THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT
 - KEY FEATURE DESIGNATIONS
H - HOLD
P - PICK-UP
S - SIGNAL
M - CONVERTIBLE, PICK-UP OR SIGNAL
 - DD & CONDUCTORS ARE TAPED AND STORED IN TELEPHONE
 - PROVIDE "M" WIRING WHEN THE BUZZER IS TO OPERATE ON 50 CYCLES AC, AND PROVIDE "N" WIRING WHEN THE BUZZER IS TO OPERATE ON DC.

TABLE A
UNIVERSAL-HAI SYSTEM CONVERSION-STATION BUSY SIGNAL CONNECTIONS CONNECTION OF HOLD KEY AND SWITCH LEADS

	KEY TEL SYS	HOLD KEY B SWITCH LEADS				MHW COND
		SL-WHT	SL-GRN	SL-YEL	VEL	
NO STATION BUSY LAMP	UNIV	1B	1B	N	N	M
WITH STATION BUSY LAMP*	UNIV	5G	LZ M	N	R	M
	HAI	1B	LZ M	R	N	M

* TERMINAL ON NETWORK

TABLE B
RINGER CONNECTIONS

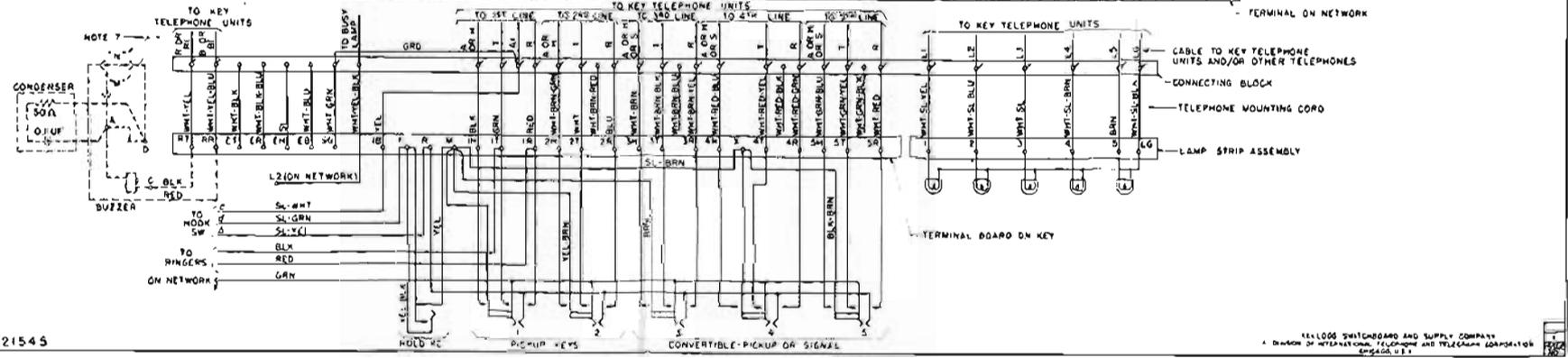
	KEY TEL SYS	RINGER OR BUZZER LEAD				
		SL-RED	SL-BLK	BLK	RED	
SET BUZZER OR BUZZER NOT TO BE CUT OFF IN SET	WHEN USED AS BRIDGED RINGER ON ANY LINE		A	R	Y	R
	WHEN USED AS PRIVATE LINE COMMON SIG OR OTHER USE		WITH COND	A	K	RT
		WITHOUT COND	A	A	RT	RR

TABLE C
PICK-UP/SIGNALING CONVERSION CONVERT FROM LOCKING TO NON-LOCKING OR VICE-VERSA AND CHANGE LEADS AS FOLLOWS

6 BUTTON SET	NO. OF PICKUP KEYS	NO. OF SIG KEYS CONVERTED FROM P.U. KEYS	NO. OF PRIVATE AND INTERCOMMUNICATING LINES WITH COMMON SIG KEY	KEY LEADS			
				VEL-BRN	BRN	SL-BRN	BLK-BRN
	5	1		M	M	M	X
	4	1		M	M	M	SG
	3	2		M	M	SG	X
	2	3		M	X	SG	X
	1	4	2	M	X	SG	SG
	4	1	3	X	X	SG	SG

COLOR OF MOUNTING CORD CONDUCTORS TO TERMINALS ON KEY AND LAMP TERMINAL STRIP

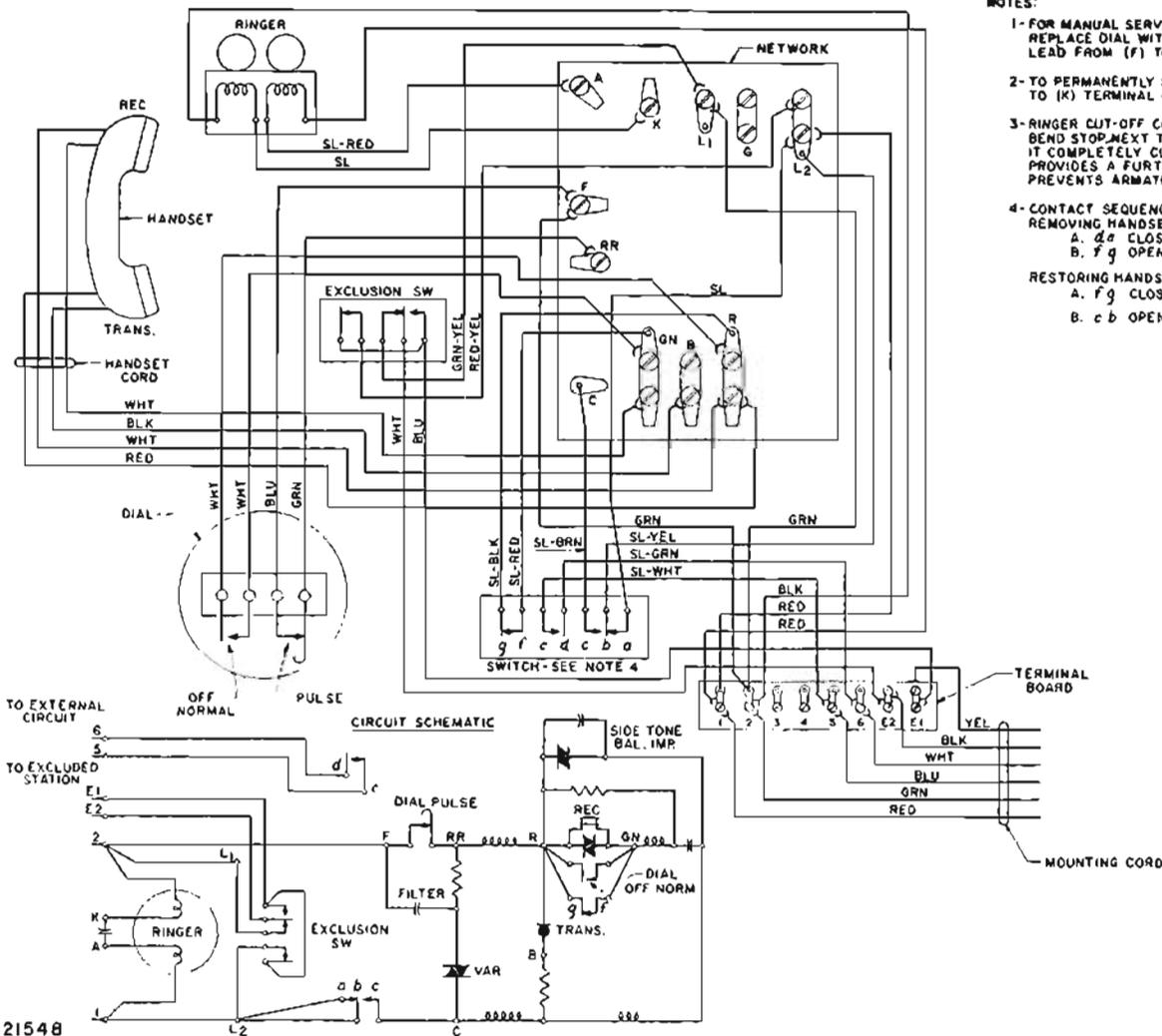
VEL CODE	KEY FEATURES SEC NOTE 8	RED	GRN	VEL	BLK	BLU	WHT	WHT-RED	WHT-BRN	WHT-GRN	WHT-BLK	WHT-BLU	WHT-WHT	WHT-RED	WHT-GRN	WHT-BLK	WHT-BLU	WHT-WHT	WHT-RED	WHT-GRN	WHT-BLK	WHT-BLU	SL	WHT-BLU	WHT-GRN	WHT-BLK	
K-364-B4	HPPPPPP	1A	1Y	1H	2R	2Y	DD	2H	3R	3Y	DD	3H	4R	4Y	DD	4H	5R	5Y	DD	5H	6R	6Y	DD	6H	7R	7Y	DD



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K-502 TYPE TELEPHONE CIRCUIT

WIRING DIAGRAM



NOTES:

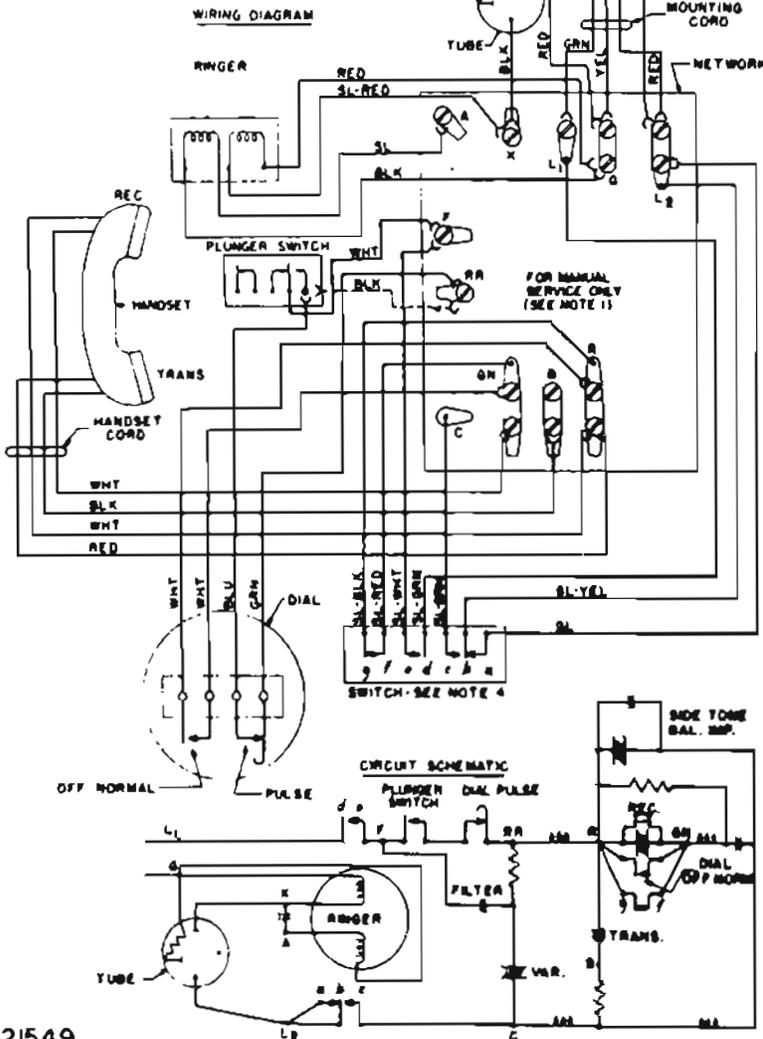
- 1- FOR MANUAL SERVICE:
REPLACE DIAL WITH DUMMY PLUG ASSEMBLY AND TRANSFER GREEN LEAD FROM (F) TO (RR) ON THE NETWORK.
- 2- TO PERMANENTLY SILENCE RINGER, TRANSFER BLACK RINGER LEAD TO (K) TERMINAL ON NETWORK.
- 3- RINGER CUT-OFF CONTROL BY CUSTOMER.
BEND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE RIM OF THE RINGER FRAME. THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT.
- 4- CONTACT SEQUENCE:
REMOVING HANDSET
A. *d* CLOSES BEFORE *c b*
B. *f g* OPENS
RESTORING HANDSET
A. *f g* CLOSES
B. *c b* OPENS BEFORE *d*

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General Ringer Section—K-500 Telephone

Kellogg Switchboard and Supply Company, A Division of ITT Corporation

K-501 TYPE TELEPHONE CIRCUIT



CLASS OF SERVICE	TABLE OF CONNECTIONS (POLARIZED RINGING)												
	CONNECTIONS AT CONNECTING BLOCK					CONNECTIONS AT NETWORK							
	LINE RING	LINE TIP	MTS COND. GRD.	MTS COND. RED	MTS COND. GRN	MTS COND. YEL	TUBE LEAD 1	TUBE LEAD 2	TUBE LEAD 3	TUBE LEAD 4			
(-) RING	R	Q	Y	R	Q	Y	L ₂	K	Q	Q	A	K	
(+) RING	R	Q	Y	R	Q	Y	Q	K	L ₂	L ₂	L ₂	A	K
(-) TIP	R	Q	Y	Q	R	Y	L ₂	K	Q	Q	Q	A	K
(+) TIP	R	Q	Y	Q	R	Y	Q	K	L ₂	L ₂	L ₂	A	K

NOTES:

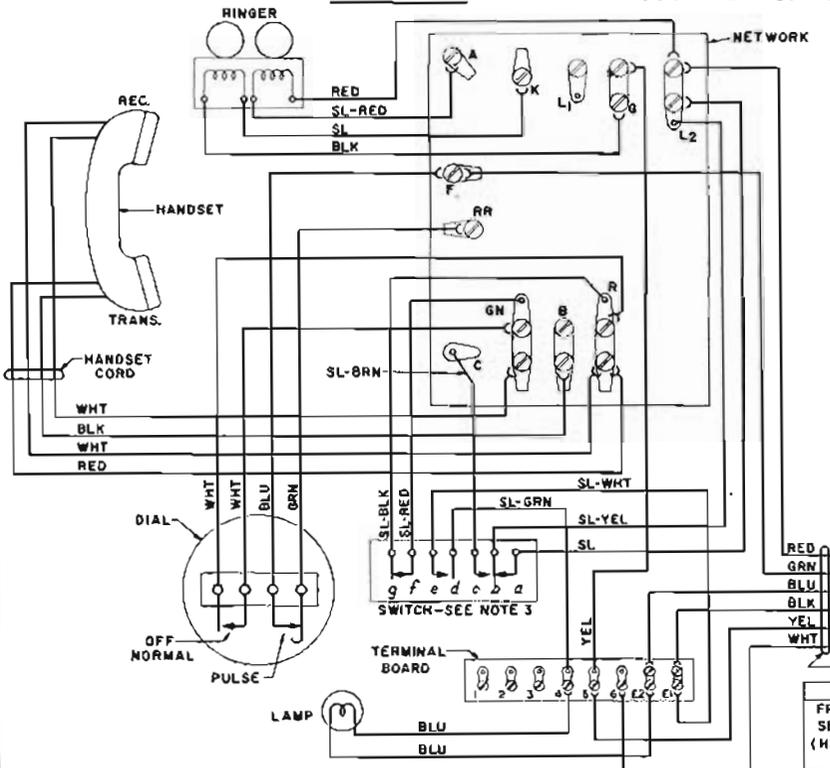
1. FOR MANUAL SERVICE:
REPLACE DIAL WITH DUMMY PLUG ASSEMBLY AND CONNECT PLUNGER SWITCH TO (RR) TERMINAL ON NETWORK WITH BLK LEAD AS SHOWN.
2. TO PERMANENTLY SILENCE RINGER:
FOR RING PARTY, CONNECT THE YELLOW MOUNTING CORD CONDUCTOR TO THE (R) TERMINAL OF THE CONNECTING BLOCK. FOR TIP PARTY CONNECT THE YELLOW MOUNTING CORD CONDUCTOR TO THE (S) TERMINAL OF THE CONNECTING BLOCK.
3. RINGER CUT-OFF CONTROL BY CUSTOMER:
BEND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE RIM OF THE RINGER FRAME. THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT.
4. WHEN THE HANDSET IS REMOVED CONTACT *g* / BREAKS LAST.

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General Ringer Section—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of IIT Corporation

WIRING DIAGRAM

K-500 TYPE TELEPHONE CIRCUIT



CLASS OF SERVICE	CONNECTIONS AT CONNECTING BLOCK												CONNECTIONS AT NETWORK				
	LINE			MTG. CORD			MTG. CORD			RINGER LEADS							
	RING	TIP	GRD.	RED	GRN	YEL	RED	GRN	YEL	RED	BLK	SL	SL-RED	SL-BLK	SL-K	SL-A	
BRIDGED Δ	1	2	3	1	2	2	L ₂	F	5*	L ₂	G	K	A				
RING PARTY Δ	1	2	3	1	2	3	L ₂	F	5*	L ₂	G	K	A				
TIP PARTY EXCEPT DIAL MESSAGE RATE	1	2	3	2	1	3	L ₂	F	5*	L ₂	G	K	A				
TIP PARTY DIAL MESSAGE RATE **	1	2	3	2	1	3	L ₂	F	5*	K	G	B	B				
AUTOMATIC TICKETING **	1	2	3	2	1	3	L ₂	F	5*	B	B	X	G				

Δ CONNECTIONS FOR BRIDGED AND RING PARTIES ARE FOR FLAT AND MESSAGE RATE SERVICE.

* TERMINAL "5" IS ON TERMINAL BOARD.

** TRANSFER SLATE SWITCH LEAD FROM (L₂) TO (A) TERMINAL ON NETWORK.

NOTES:

- 1- TO PERMANENTLY SILENCE RINGER: FOR BRIDGED, RING PARTY AND TIP PARTY EXCEPT DIAL MESSAGE RATE SERVICE, TRANSFER BLACK RINGER LEAD TO (K) TERMINAL ON NETWORK. (SEE NOTE 8)
- 2- RINGER CUT-OFF CONTROL BY CUSTOMER: BEND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE RIM OF THE RINGER FRAME. THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT.
- 3- WHEN THE HANDSET IS REMOVED CONTACT *g* BREAKS LAST.
- 4- MOUNT THE CONDENSER FURNISHED ON THE "K" TERMINAL OF THE NETWORK. CONNECT THE LOOSE CONDENSER LEAD TO THE "G" TERMINAL.
- 5- CONNECT JUMPER FROM "A" TO "B" ON THE NETWORK.
- 6- CONNECT 6 OR BV AC OR DC FOR DIAL LIGHT TO TERMINALS 7 & 8 ON CONNECTING BLOCK.
- 7- CONNECT MOUNTING CORD WHT, BLU AND BLK TO TERMINALS 6, 7 & 8 ON CONNECTING BLOCK RESPECTIVELY.

- 8- TO PERMANENTLY SILENCE RINGER: FOR TIP PARTY DIAL MESSAGE RATE SERVICE, TRANSFER SLATE-RED RINGER LEAD TO THE (K) TERMINAL. BLACK LEAD TO (G) AND SLATE LEAD TO (B) MUST REMAIN CONNECTED FOR PARTY IDENTIFICATION.
- FOR AUTOMATIC TICKETING, TRANSFER BLACK RINGER LEAD TO THE (K) TERMINAL.

TABLE OF RINGERS			
FREQUENCY SELECTIVE (HARMONIC) TYPES	CY.	PTY.	CONNECTIONS IN SET
HA 1 33/3	1		SEE NOTE 4
HA 2 50 2			4
HA 3 66 2/3	3		4
HA 4 116 2/3	4		5
HA 6 25 5			5
HB 1 30 1			5
HB 2 42 2			4
HB 3 54 3			4
HB 4 66 4			4
HB 5 18 5			5
HC 1 20 1			3
HC 2 60 2			4
HC 3 30 3			5
HC 4 40 4			4
HC 5 50 5			4

RINGING SERVICE	CONNECTIONS AT CONNECTING BLOCK						CONN. IN SET (ALSO SEE TABLE OF RINGERS)	
	LINE		MTG. CORD		RINGER LEADS			
	RING	TIP	GRD	RED	GRN	YEL	RED	BLACK
BRIDGED	1	2	3	1	2	2	L ₂	K
RING PARTY	1	2	3	1	2	3	L ₂	K
TIP PARTY	1	2	3	2	1	3	L ₂	K

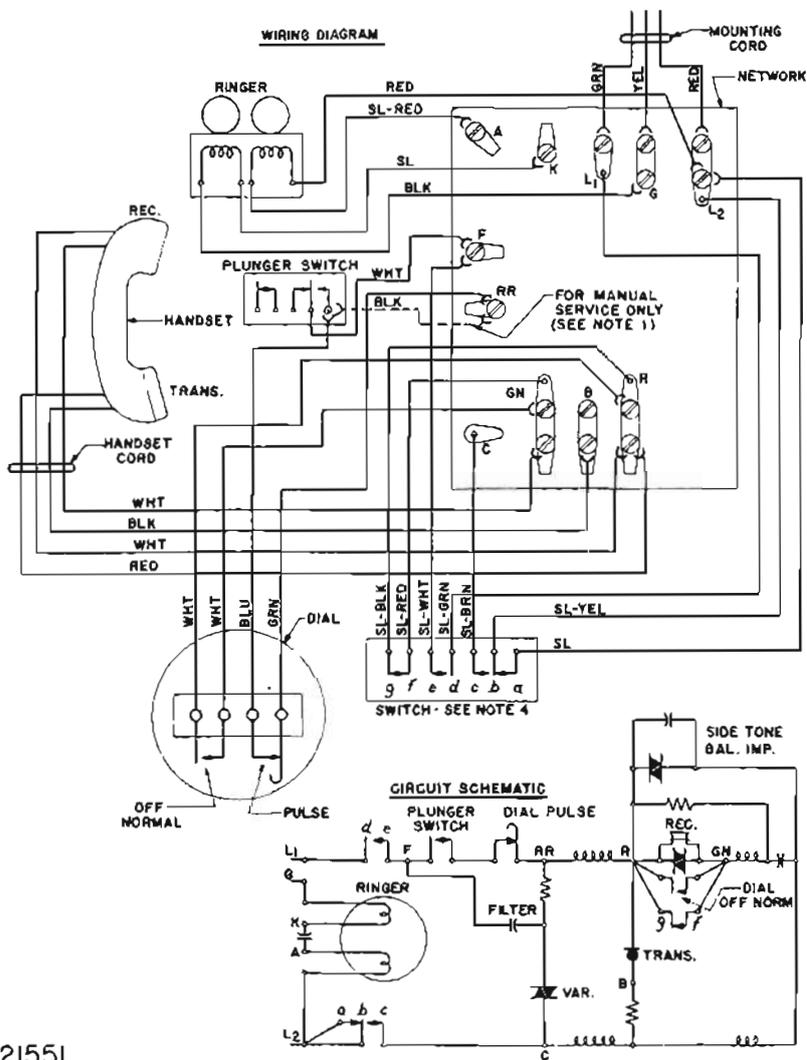
! IF GROUND WIRE IS BROUGHT TO CONNECTING BLOCK

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General Ringer Section—K-500 Telephone

Kellogg Switchboard and Supply Company, A Division of ITT Corporation

K-500 TYPE TELEPHONE CIRCUIT



CLASS OF SERVICE	TABLE OF CONNECTIONS (BIASED RINGERS) (SEE NOTES 1 TO 4)												
	CONNECTIONS AT CONNECTING BLOCK						CONNECTIONS AT NETWORK						
	LINE			MTG. CORD			MTG. CORD			RINGER LEADS			
	RING	TIP	GRD.	RED	GRN	YEL	RED	GRN	YEL	RED	BLK	SL	SL-RED
BRIDGED Δ	R	G	Y	R	G	G	L ₂	L ₁	G	L ₂	G	K	A
RING PARTY Δ	R	G	Y	R	G	Y	L ₂	L ₁	G	L ₂	G	K	A
TIP PARTY EXCEPT DIAL MESSAGE RATE	R	G	Y	G	R	Y	L ₂	L ₁	G	L ₂	G	K	A
TIP PARTY DIAL MESSAGE RATE *	R	G	Y	G	R	Y	L ₂	L ₁	G	K	G	B	B
AUTOMATIC TICKETING #	R	G	Y	G	R	Y	L ₂	L ₁	G	B	B	X	G

Δ CONNECTIONS FOR BRIDGED AND RING PARTIES ARE FOR FLAT AND MESSAGE RATE SERVICE.

* TRANSFER SLATE SWITCH LEAD FROM (L₂) TO (A) TERMINAL ON NETWORK.

NOTES:

1. FOR MANUAL SERVICE: REPLACE DIAL WITH DUMMY PLUG ASSEMBLY AND CONNECT PLUNGER SWITCH TO (RR) TERMINAL ON NETWORK WITH BLK LEAD AS SHOWN.
2. TO PERMANENTLY SILENCE RINGER: FOR BRIDGED, RING PARTY AND TIP PARTY EXCEPT DIAL MESSAGE RATE SERVICES, TRANSFER BLACK RINGER LEAD TO (A) TERMINAL ON NETWORK. FOR TIP PARTY DIAL MESSAGE RATE SERVICE, TRANSFER SLATE-RED RINGER LEAD TO THE (K) TERMINAL, BLACK LEAD TO (G) AND SLATE LEAD TO (B) MUST REMAIN CONNECTED FOR PARTY IDENTIFICATION. FOR AUTOMATIC TICKETING, TRANSFER BLACK RINGER LEAD TO THE (X) TERMINAL.
3. RINGER CUT-OFF CONTROL BY CUSTOMER: BEND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE RIM OF THE RINGER FRAME. THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT.
4. WHEN THE HANDSET IS REMOVED CONTACT 'g' BREAKS LAST.

TABLE OF RINGERS									
FREQUENCY SELECTIVE (HARMONIC) TYPES	CY.	PTY.	MFO.	CONNECTIONS IN SET					
					1	2	3	4	5
HA 1	33/3	1	35	SEE NOTE 5					
HA 2	30	2	1						5
HA 3	862/2	3	1						5
HA 4	162/3	4							6
HA 5	28	5							6
HB 1	30	1							6
HB 2	42	2	25						5
HB 3	54	3	1						5
HB 4	66	4	1						5
HB 5	16	5							6
HC 1	20	1							6
HC 2	60	2	1						5
HC 3	30	3							6
HC 4	40	4	25						3
HC 5	50	5	1						5

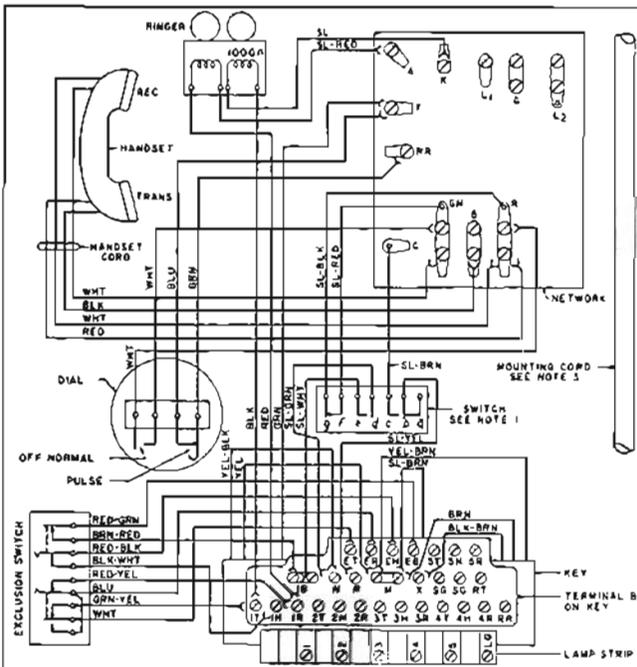
NOTES:

5. MOUNT THE CAPACITOR FURNISHED WITH RINGER ON THE LEFT SIDE OF THE DIAL BRACKET. CONNECT THE LEADS OF CAPACITOR TO THE 'K' AND 'G' TERMINALS ON NETWORK.
6. CONNECT JUMPER FROM 'A' TO 'G' ON THE NETWORK

RINGING SERVICE	CONNECTIONS FOR FREQUENCY SELECTIVE RINGERS												
	CONNECTIONS AT CONNECTING BLOCK						CONN. IN SET (ALSO SEE TABLE OF RINGERS)						
	LINE			MTG. CORD			RINGER LEADS			RINGER LEADS			
	RING	TIP	GRD.	RED	GRN	YEL	RED	GRN	YEL	RED	BLK	SL	SL-RED
BRIDGED	R	G	Y	R	G	G	L ₂	L ₁	G	L ₂	G	K	A
RING PARTY	R	G	Y	R	G	Y	L ₂	L ₁	G	L ₂	G	K	A
TIP PARTY	R	G	Y	G	R	Y	L ₂	L ₁	G	L ₂	G	K	A

* IF GROUND WIRE IS BROUGHT TO CONNECTING BLOCK

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- NOTES
- 1-CONTACT SEQUENCE REMOVING HANDSET
A d₁ CLOSSES BEFORE c₃
B f₁ OPENS
RESTORING HANDSET
A f₂ CLOSSES
B c₃ OPENS BEFORE d₂
 - 2-FOR MANUAL SERVICE REPLACE DIAL WITH DUMMY PLUG ASSEMBLY AND TRANSFER GREEN KEY LEAD FROM (F) TERMINAL TO (RR) TERMINAL ON NETWORK.
 - 3-SEE TABLE FOR CONNECTIONS
 - 4-FOR RINGER CUT-OFF CONTROL BY CUSTOMER BEND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE RIM OF THE RINGER FRAME THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT
 - 5-KEY FEATURE DESIGNATIONS:
W=HOLD
M=PICK-UP
R=CONVERTIBLE, PICK-UP OR SIGNAL
 - 6-6DD & CONDUCTORS ARE TAPED AND STORED IN TELEPHONE
 - 7-PROVIDE "M" WIRING WHEN THE BUZZER IS TO OPERATE ON 60 CYCLES AC, AND PROVIDE "W" WIRING WHEN THE BUZZER IS TO OPERATE ON DC.

TABLE A
UNIVERSAL KIAL SYSTEM CONVERSION-STATION BUSY SIGNAL CONNECTIONS
CONNECTION OF HOLD KEY A SWITCH LEADS

	TEL SYS	SL-WHT	SL-GRN	SL-YEL	YEL	VEL-BLK	WHT CORD
NO STATION BUSY LAMP	UNIV	1B	1B	N	N	M	M
WITH STATION BUSY LAMP	UNIV	1B	N	R	M	M	M
	KIAL	1B	N	R	M	M	M
	UNIV	1B	L2 #	N	R	M	M
	KIAL	1B	L2 #	R	M	N	GM TO N

■ TERMINAL ON NETWORK

TABLE B
RINGER CONNECTIONS

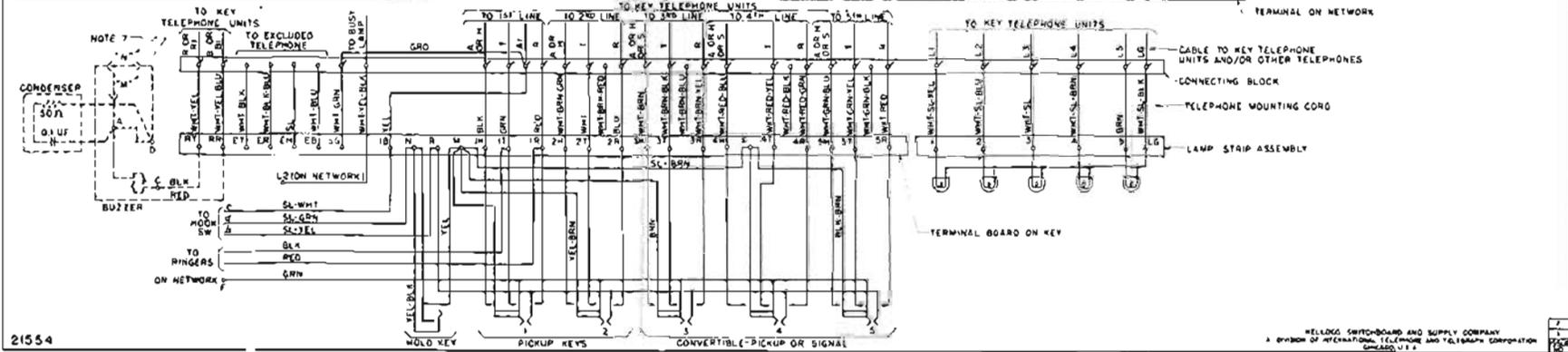
SET RINGER OR BUZZER NOT TO BE CUT OFF IN SET	RINGER OR BUZZER LEAD			
	SL-RED	SL	BLK	RED
WHEN USED AS BRIDGED RINGER ON ANY LINE	A	K	F	R
WHEN USED AS PRIVATE LINE COMMON SIG. OR OTHER USE	WITH COND	A	K	
	WITHOUT COND	A		RT RR

TABLE C
PICKUP-SIGNAL LINE CONVERSION
CONVERT FROM LOCKING TO NON-LOCKING OR VICE-VERSA AND CHANGE LEADS AS FOLLOWS

B BUTTON SET	NO. OF PICKUP KEYS	NO. OF SIG. KEYS CONVERTED FROM P.U. KEYS	NO. OF PRIVATE AND INTERCOMMUNICATING LINES WITH COMMON SIG. KEY	KEY LEADS			
				VEL-BRN	BRN	SL-BRN	BLK-BRN
	0			M	M	M	X
	1	1		M	M	M	SG
	2	2		M	M	SG	X
	3	3		M	X	SG	X
	4	1	2	M	X	SH	SG
	4	1	3	X	X	SH	SG

TABLE D
COLOR OF MOUNTING CORD CONDUCTORS TO TERMINALS ON KEY AND LAMP TERMINAL STRIP

TEL CODE	KEY FEATURES SEE NOTE 1	RED	GRN	YEL	BLK	BLU	WHT	WHT-GRN	WHT-BRN	WHT-YEL	WHT-BLK	WHT-BLU	WHT-WHT	WHT-GRN	WHT-BRN	WHT-YEL	WHT-BLK	WHT-BLU	WHT-WHT	SL	BLU	GRN	WHT-YEL	
K-563-BN	MP	1R	1T	1B	1H	2R	2T	DD	2H	3R	3T	DD	3H	4R	4T	DD	4H	5R	5T	DD	5H	6R	6T	6H



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K-500 TYPE TELEPHONE CIRCUIT

WIRING DIAGRAM

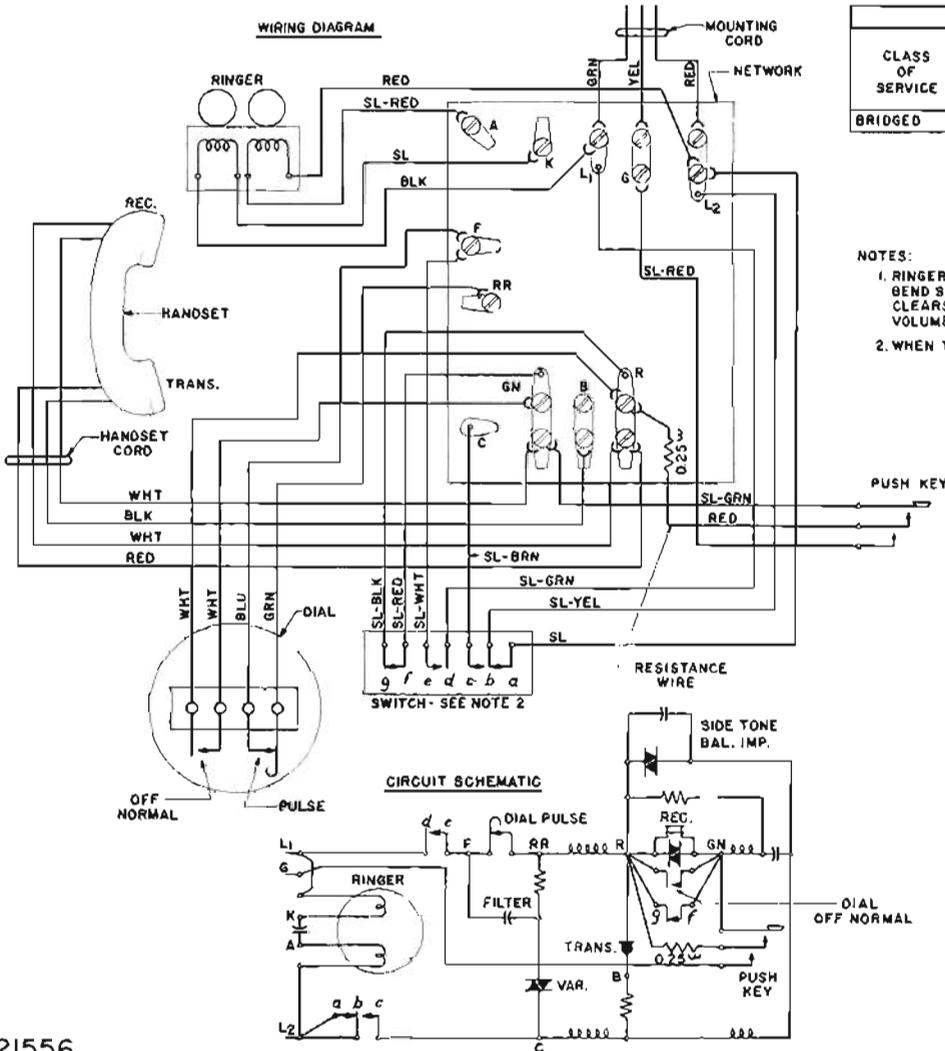


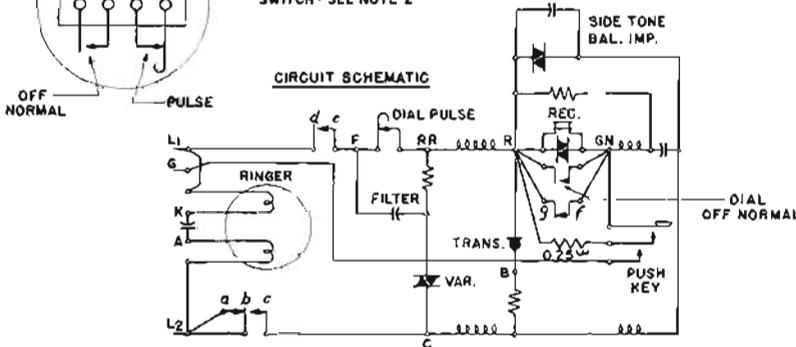
TABLE OF CONNECTIONS

CLASS OF SERVICE	CONNECTIONS AT												
	CONNECTING BLOCK						NETWORK						
	T-14 REPEATER			MTG. CORD			MTG. CORD			RINGER LEADS			
	B	7	9	RED	GRN	YEL	RED	GRN	YEL	RED	BLK	SL	SL-RED
BRIDGED	R	G	Y	R	G	Y	L ₂	L ₁	G	L ₂	L ₁	K	A

NOTES:

1. RINGER CUT-OFF CONTROL BY CUSTOMER:
BEND STOP NEXT TO DETENT ON RINGER VOLUME CONTROL SO THAT IT COMPLETELY CLEARS THE RIM OF THE RINGER FRAME. THIS PROVIDES A FURTHER POSITION ON VOLUME CONTROL WHICH PREVENTS ARMATURE MOVEMENT.
2. WHEN THE HANDSET IS REMOVED CONTACT *gf* BREAKS LAST.

CIRCUIT SCHEMATIC

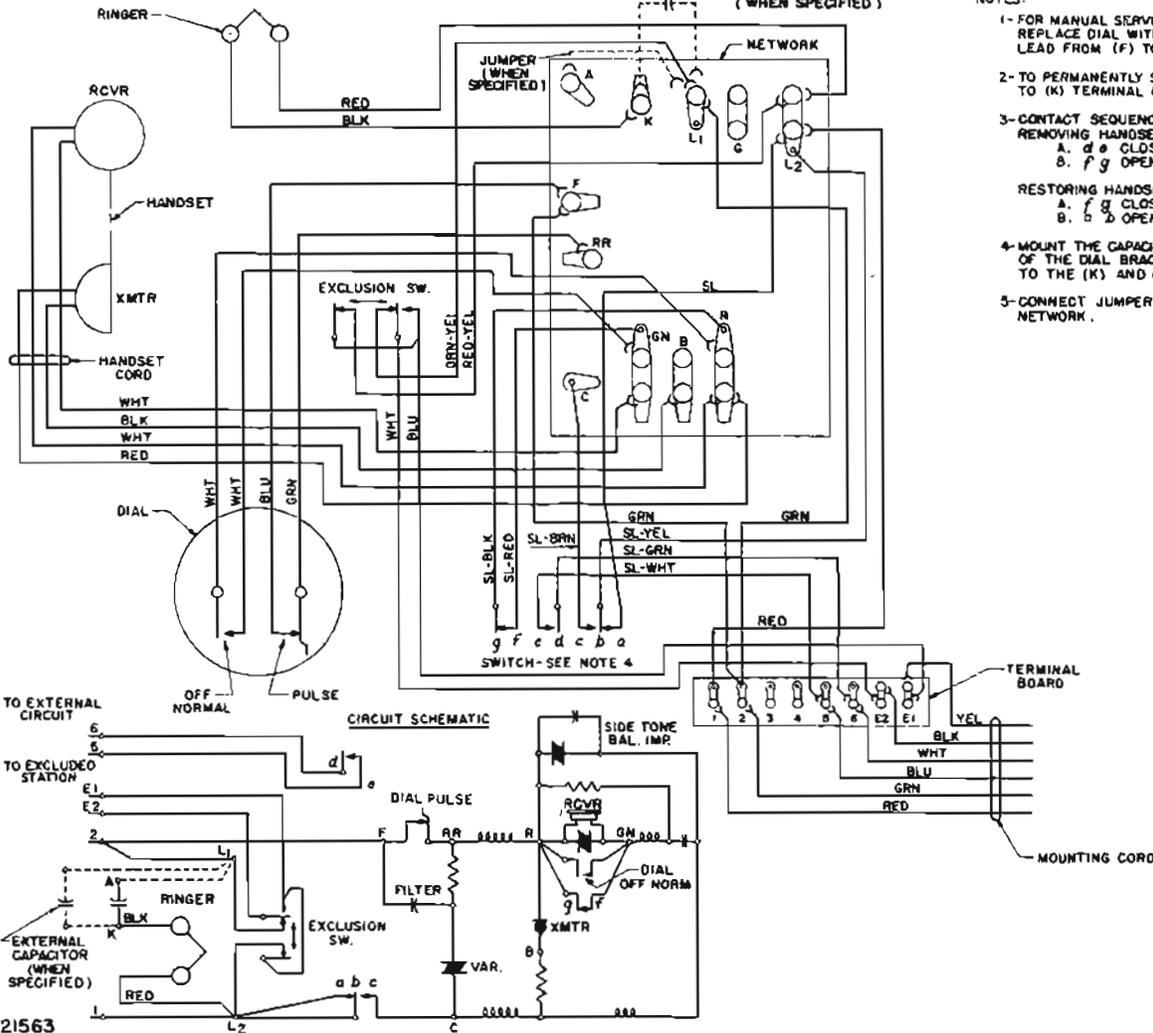


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1
CIRCUIT
IMP.

K-502 TYPE TELEPHONE CIRCUIT

WIRING DIAGRAM



NOTES:

- 1- FOR MANUAL SERVICE:
REPLACE DIAL WITH DUMMY PLUG ASSEMBLY AND TRANSFER GREEN LEAD FROM (F) TO (RR) ON THE NETWORK.
- 2- TO PERMANENTLY SILENCE RINGER, TRANSFER RED RINGER LEAD TO (K) TERMINAL ON NETWORK.
- 3- CONTACT SEQUENCE:
REMOVING HANDSET
A. d o CLOSES BEFORE c b
B. f g OPENS
RESTORING HANDSET
A. f g CLOSES
B. b d OPENS BEFORE d o
- 4- MOUNT THE CAPACITOR FURNISHED WITH RINGER ON THE LEFT SIDE OF THE DIAL BRACKET. CONNECT THE LEADS OF THE CAPACITOR TO THE (K) AND (L1) TERMINALS ON THE NETWORK.
- 5- CONNECT JUMPER FROM (A) TO (L1) TERMINALS ON THE NETWORK.

TABLE OF RINGERS			
PTY.	FREQUENCY SELECTIVE (HARMONIC) TYPES	VALUE OF EXTERNAL CAPACITOR UF	CONNECTIONS IN SET
HA1	33 1/3	.35	SEE NOTE 4
HA2	50	.1	4
HA3	66 2/3	.1	4
HA4	16 2/3	—	5
HA5	25	—	5
HB1	30	—	5
HB2	42	.25	4
HB3	54	.1	4
HB4	66	.1	4
HB5	16	—	5
HC1	20	—	5
HC2	30	.1	4
HC3	40	—	5
HC4	50	.25	4
HC5	60	.1	4

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Kellogg Switchboard and Supply Company, A Division of ITT Corporation

III. MAINTENANCE

A. Ringer Removal

To remove the ringer from the base assembly, loosen the two cabinet lock screws at each end of the base plate. Remove the base assembly from the housing-plunger assembly. Be careful not to lose the gasket on the dial. Next, disconnect the coil conductors from the terminal screws at the network assembly. Remove the mounting screw of each mounting screw assembly from each ringer mounting bracket of the base assembly. Lift the ringer until the control assembly clears the base plate hole. Pull the ringer forward and out of the base assembly, disengaging the locating pin on the frame assembly from the rubber grommet in the cradle switch assembly. Upon replacement, reassemble in the reverse order.

B. Piece Part Removal and Disassembly for Replacement

1. Biased Ringer [Code 130(BA)470], Figure 1, Page 58

a. To remove Coil Assembly and Core Lamination, disconnect the coil terminals at the network assembly. Remove the two screws (2) which secure the coil assembly to the support pole piece assembly. Remove the coil assembly (1) and core lamination (3). Remove the core lamination from the coil assembly. Upon replacement, reassemble in the reverse order.

b. To remove the Support Pole Piece Assembly (4), remove the coil assembly. Lift the support pole piece assembly off the frame assembly (10). Upon replacement, reassemble in the reverse order.

Caution

It is necessary to remagnetize and artificially age the magnet to an optimum operating value and readjust bias

General Ringer Section—K-500 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

tension after this disassembly procedure. It is not recommended that this be attempted at the subscriber's premises since special equipment is required for proper adjustment.

c. To remove Magnet, remove the coil assembly and support pole piece assembly. Slide the magnet (5) out of its holder in the frame assembly (10). Upon replacement, reassemble in the reverse order. See CAUTION note above.

d. To remove Clapper Assembly, remove the screw (9) from Clapper Assembly (6). Pull the clapper assembly back to disengage the biasing spring wire from the spring wire bracket. Remove the clapper assembly. Upon replacement, reassemble in the reverse order. See CAUTION note above.

e. To remove Gongs (7) and (8), remove the two lock-washer screws (9) and remove the gongs. Upon replacement, reassemble in the reverse order.

f. To disassemble the Frame Assembly (10), remove the ringer, coil assembly and core lamination, support pole piece assembly, magnet, clapper assembly, and gongs. The Control Wheel, detent spring, and the two Resonators cannot be further disassembled. Upon replacement, reassemble in the reverse order. See CAUTION note above.

g. Two Mounting Screws (11) are inserted through two Rubber Feet (12) and are assembled to Base Assembly. No lock washers are required.

2. Frequency Selective Ringers [Codes 131 and 133 Type], See Figure 4, Page 62

Caution

It is necessary to remagnetize the magnet after disassembly of either the armature, magnet or shunt bar. It is not recommended that this be attempted at the subscriber's premises, since special equipment is required for proper adjustment.

a. To remove Coil Assembly (15) and the Slide Plate and Lamination Assembly (16) disconnect the coil terminals

at the network assembly. Remove the screw which mounts the slide plate (6). Loosen the two screws that mount the shunt bar (10), so that the slide plate assembly and coil assembly can be lifted above the eccentric stud (22). Then slide both units away from the shunt bar, and lift free. Slide the laminations out the coil. Upon replacement, reassemble in reverse order.

b. To remove Shunt Bar (10) and Magnet (7), remove the two screws (20) which mount the shunt bar (10) to the frame, and the two screws (21) which mount the magnet clamping plate (8). Lift the magnet and shunt bar. (Be sure to replace the magnet with the unfinished face toward the magnet clamping plate). Upon replacement, reassemble in the reverse order. See CAUTION note above.

c. To remove armature and weight assembly (14), remove the armature mounting screws (18). Upon replacement, reassemble in reverse order.

d. To remove the Mounting Frame (5), remove the ringer, coil, slide plate and lamination assembly, shunt bar, magnet, armature and weight assembly and clamping plates. Remove the control wheel mounting screws (19) and detach the gong and resonator assemblies and the control spring assembly. Remove the eccentric stud (22) by slipping off the retaining ring (23). Upon replacement, reassemble in the reverse order. See CAUTION note above.

SECTION SIX

**GENERAL
DESCRIPTION
KELLOGG K-554
WALL
TELEPHONE**

General Description—K-554 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation



K554 WALL TELEPHONE

I. GENERAL INFORMATION

A. General

The Kellogg Code 554 Telephone is a standard common battery wall type telephone. All of the Code 554 Telephones may be used for dial or manual common battery services. Kellogg high impedance ringers are standard for Biased, Harmonic, Synchronomic, and Decimonic ringing services.

B. Major Components

The major components of the dial and manual wall telephone sets consist of the handset (with cord), housing assembly, and base assembly.

1. Handset and Handset Cord: For description see "Handset Section" (Section Four) of the K-500 Desk Telephone.

2. Housing Assembly: The housing assembly, which covers and protects the telephone components, is fastened to the base assembly by a hook bracket and a push-to-release catch.

3. Base Assembly: The base assembly consists of the dial, hookswitch assembly, ringer, and network assembly, all mounted on a steel base plate.

a) Dial: For description see "Dial Section" (Section Three) of the K-500 Desk Telephone.

b) Hookswitch Assembly: The hookswitch assembly consists of an operating arm mounted on a pivot pin, a spring which raises the arm, an operating bar which actuates the contact springs, and a cover to protect the spring assembly. The entire assembly is mounted on a frame which is secured to the base plate by four removable screws. In function, the switch assembly connects the line, handset, dial, and network.

c) Ringer: For description see "Ringer Section" (Section Five) of the K-500 Desk Telephone.

d) Network Assembly: For description see "General Description Section" (Section One) of the K-500 Desk Telephone.

General Description—K-554 Telephone

Kellogg Switchboard and Supply Company, A Division of ITT Corporation

d) Base Plate: The base plate consists of the dial mounting bracket, the volume control lever, two hooks for fastening the housing assembly, and two slotted holes, one at each end, for mounting the telephone to the wall. The handset cord is inserted through the lower hook, which has a hole for the attachment of the clamp hook on the handset cord. This provides strain relief and prevents the cord from being pushed into the base and interfering with the operation of moving parts.

II. INSTALLATION

See "Installation and Trouble Shooting Section" (Section Two) of the K-500 Desk Telephone.

III. MAINTENANCE

For Dial, Handset, and Ringer maintenance, refer to the specific section (Sections Three, Four, or Five) of the K-500 Desk Telephone.

A. Maintenance Checks

Hookswitch Assembly: Except for lubrication of the pivot pins, field maintenance of the spring nest assembly must be performed by qualified personnel or only when permitted by local practice. If lubrication is required, apply Molykote at the junction of the pivot pin with the operating arm and mounting frame.

Caution

Do not permit the lubricant to fall on the contact springs of the hookswitch assembly.

Maintenance of Spring Nest Assembly: (See Fig. 3, Page 9, Section One of the K-500 Desk Telephone).

On the spring nest assembly, make sure both contacts on contact spring assembly "b" have a perceptible follow. When the operating arm is in its upper position, there should be a minimum gap of 1/64 inch between the contacts of contact spring assemblies "a" and "b", and "g" and "f".

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Kellogg Switchboard and Supply Company, A Division of ITT Corporation

When the operating arm is depressed, there should be a minimum gap of 1/64 inch between the contacts of contact spring assemblies "b" and "c" and "e" and "d". In all cases, both contacts of a spring should make or break at the same time.

When the handset is lifted from the handset cradle, the contacts should make before the cradle comes to a positive stop, with contacts "g" and "f" opening last; when the cradle is depressed, the line circuit should be open before the cradle comes to a positive stop. Check both actions visually.

B. Disassembly Procedures

1. Removal of Housing from Base Assembly: Push the bottom of the housing toward the base while pressing inward on the release catch at the bottom of the base plate. Then lift the housing out and upward to disengage the upper catch from the hook on the base assembly. Lift the housing enough to pass the handset cradle through the dial opening of the housing. Upon replacement, reassemble in reverse order.

2. Dial: Remove the housing from the base assembly. Loosen the two screws securing the dial to the mounting bracket and disconnect the dial conductors from the network assembly. Remove the dial. Reassemble in reverse order.

3. Hookswitch Assembly: Remove the housing from the base assembly. Disconnect and unsolder all hookswitch conductors at the network assembly. Remove the four nuts, spring washers, and screws which secure the assembly to the base plate. Remove the hookswitch assembly. Upon replacement, reassemble in reverse order.

4. Ringer: Remove the housing from the base assembly. Disconnect the ringer coil conductors from the network assembly. Remove the screws from the two mounting holes in the base plate. Pull the ringer forward and out of the base assembly, disengaging the locating pin on the frame assembly from the rubber grommet in the vertical bracket in the base plate. Upon replacement, reassemble in reverse order.

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Kellogg Switchboard and Supply Company, A Division of ITT Corporation

5. Network assembly: Remove the housing from the base assembly. Disconnect and unsolder all conductors at the network assembly. Remove the two nuts, spring washers, and screws which secure the assembly to the base plate. Remove the network assembly. Upon replacement, reassemble in reverse order.

TABLE I
LIST OF REPLACEMENT PARTS

INDEX No.	NAME OF PART	PART No.	QTY.
1	Handset	See Handset Section of K-500 Desk Telephone	1
2	Number Card Assem.	75418 for Black Tel. only 75418 (2) for Colored Manual Telephone only 80076 for Colored Dial Telephone only	1
3	Dummy Plug	79455 (*)	1
4	Clamping Plate	79443	1
5	R.H. Self Tapping Sc.	75407 (4)	2
6	R.H. Machine Screw	74222 (2)	1
7	Housing Assembly	79406 (*)	1
8	Vinyl Gasket	75474 for Black Telephone only 75474 (2) for Colored Telephone only	1
9	Dial	See Dial Section of K-500 Desk Telephone	1
10	Mounting Screw	75487 (2)	2
11	Network	75335	1
12	Terminal Screws	75392 (2)	15
13	Ringer	See Ringer Section of K-500 Desk Telephone	1
14	Base Assembly	79398	1
15	Spring Washer	54336 (5)	6
16	Bind Hd. Mach. Sc.	69116 (3)	6
17	Hex. Nut	67093	6
18	Hookswitch Assem.	79399	1

*Indicate desired color code designation
(See Page 14, Section One of K-500 Desk Telephone).

General Description—K-554 Telephone
Kellogg Switchboard and Supply Company, A Division of ITT Corporation

TABLE II: K-554 WALL TYPE TELEPHONES WITH BIASED RINGERS

CODE No.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	HANDSET	CIRCUIT DRAWING
55400 (BA) 00 D	Ringer Volume Control. Straight Cord.	1900 (G) 450	130 (BA) 470	6500 (C) 410	21531
554** (BA) 02 D	Ringer Volume Control. Coiled Cord.	19** (G) 450	130 (BA) 470	65** (C2) 410	21531
55400 (BA) 03 D	Ringer Volume Control. Vacuum Tube.	1900 (G) 450	130 (BA) 470	6500 (C) 410	21535
55400 (BA) 04 D	Ringer Volume Control. Tropicalized. Indent. on base, "Property of Puerto Rico Telephone Co."	1900 (D) 450	130 (BA) 470	6500 (C) 410	21533
55400 (BA) 05 D	Ringer Volume Control. Coiled Cord. Vacuum Tube.	1900 (G) 450	130 (BA) 470	6500 (C2) 410	21535
554** (BA) 06 D	Ringer Volume Control. Coiled Cord. P-79857 Push Key Assem.	19** (D) 450	130 (BA) 470	65** (C2) 410	21556
55400 (BA) 07 D	Ringer Volume Control. Straight Cord. Terminal Board Assem.	1900 (D) 450	130 (BA) 470	6500 (C) 410	21531
554** (BA) 08 D	Ringer Volume Control. Coiled Cord.	19** (D) 450	130 (BA) 470	65** (C2) 410	21531
55400 (BA) 09 D	Ringer Volume Control. Straight Cord.	1900 (D) 450	130 (BA) 470	6500 (C) 410	21569
554** (BA) 10 D	Ringer Volume Control. Coiled Cord. Terminal Board Assem.	19** (D) 450	130 (BA) 470	65** (C2) 410	21569
55400 (BA) 00 N	Ringer Volume Control. Straight Cord.	Dummy Plug	130 (BA) 470	6500 (C) 410	21531
554** (BA) 02 N	Ringer Volume Control. Coiled Cord.	Dummy Plug	130 (BA) 470	65** (C2) 410	21531

**Color Coding. See Figure 6, Page 12, Section One for K-500 Desk Telephone.

**TABLE III:
K-554 WALL TELEPHONES WITH FREQUENCY SELECTIVE RINGERS**

CODE No.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	HANDSET	CIRCUIT DRAWING
55400 (HA 1 to 5) 00 D	Ringer Volume Control. Straight Cord.	1900 (G) 450	131 (HA 1 to 5) 470	6500 (C) 410	21531
554** (HA 1 to 5) 02 D	Ringer Volume Control. Coiled Cord.	19** (G) 450	131 (HA 1 to 5) 470	65** (C2) 410	21531
55400 (HA 1 to 5) 03 D	Less Ringer Volume Control. Straight Cord.	1900 (G) 450	133 (HA 1 to 5) 470	6500 (C) 410	21531
554** (HA 1 to 5) 06 D	Less Ringer Volume Control. Coiled Cord.	19** (G) 450	133 (HA 1 to 5) 470	65** (C2) 410	21531
55400 (HA 1 to 5) 00 N	Ringer Volume Control. Straight Cord.	Dummy Plug	131 (HB 1 to 5) 470	6500 (C) 410	21531
554** (HA 1 to 5) 02 N	Ringer Volume Control. Coiled Cord.	Dummy Plug	131 (HA 1 to 5) 470	65** (C2) 410	21531
55400 (HA 1 to 5) 03 N	Less Ringer Volume Control. Straight Cord.	Dummy Plug	133 (HA 1 to 5) 470	6500 (C) 410	21531
554** (HA 1 to 5) 06 N	Less Ringer Volume Control. Coiled Cord.	Dummy Plug	133 (HA 1 to 5) 470	65** (C2) 410	21531
55400 (HB 1 to 5) 00 D	Ringer Volume Control. Straight Cord.	1900 (G) 450	131 (HB 1 to 5) 470	6500 (C) 410	21531
554** (HB 1 to 5) 02 D	Ringer Volume Control. Coiled Cord.	19** (G) 450	131 (HB 1 to 5) 470	65** (C2) 410	21531
55400 (HB 1 to 5) 03 D	Less Ringer Volume Control. Straight Cord.	1900 (G) 450	133 (HB 1 to 5) 470	6500 (C) 410	21531
554** (HB 1 to 5) 06 D	Less Ringer Volume Control. Coiled Cord.	19** (G) 450	133 (HB 1 to 5) 470	65** (C2) 410	21531
55400 (HB 1 to 5) 00 N	Ringer Volume Control. Straight Cord.	Dummy Plug	131 (HB 1 to 5) 470	6500 (C) 410	21531

**Color Coding. See Figure 6, Page 12, Section One for K-500 Desk Telephone.

TABLE III: (Continued)
K-554 WALL TELEPHONES WITH FREQUENCY SELECTIVE RINGERS

CODE No.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	HANDSET	CIRCUIT DRAWING
554** (HB 1 to 5) 02 N	Ringer Volume Control. Coiled Cord.	Dummy Plug	131 (HB 1 to 5) 470	65** (C2) 410	21531
55400 (HB 1 to 5) 03 N	Less Ringer Volume Control. Straight Cord.	Dummy Plug	133 (HB 1 to 5) 470	6500 (C) 410	21531
554** (HB 1 to 5) 06 N	Less Ringer Volume Control. Coiled Cord.	Dummy Plug	133 (HB 1 to 5) 470	65** (C2) 410	21531
55400 (HC 1 to 5) 00 D	Ringer Volume Control. Straight Cord.	1900 (G) 450	131 (HC 1 to 5) 470	6500 (C) 410	21531
554** (HC 1 to 5) 02 D	Ringer Volume Control. Coiled Cord.	19** (G) 450	131 (HC 1 to 5) 470	65** (C2) 410	21531
55400 (HC 1 to 5) 03 D	Less Ringer Volume Control. Straight Cord.	1900 (G) 450	133 (HC 1 to 5) 470	6500 (C) 410	21531
554** (HC 1 to 5) 06 D	Less Ringer Volume Control. Coiled Cord.	19** (G) 450	133 (HC 1 to 5) 470	65** (C2) 410	21531
55400 (HC 1 to 5) 00 N	Ringer Volume Control. Straight Cord.	Dummy Plug	131 (HC 1 to 5) 470	6500 (C) 410	21531
554** (HC 1 to 5) 02 N	Ringer Volume Control. Coiled Cord.	Dummy Plug	131 (HC 1 to 5) 470	65** (C2) 410	21531
55400 (HC 1 to 5) 03 N	Less Ringer Volume Control. Straight Cord.	Dummy Plug	133 (HC 1 to 5) 470	6500 (C) 410	21531
55400 (HC 1 to 5) 04 N	Less Ringer Volume Control. Straight Cord. Tropicalized. Indent. on base, "Property of Puerto Rico Tel. Co."	Dummy Plug	133 (HC 1 to 5) 470	6500 (C) 410	21533
554** (HC 1 to 5) 06 N	Less Ringer Volume Control. Coiled Cord.	Dummy Plug	133 (HC 1 to 5) 470	65** (C2) 410	21531

**Color Coding. See Figure 6, Page 12, Section One for K-500 Desk Telephone.

TABLE IV: K-554 WALL TYPE TELEPHONES LESS RINGERS

CODE No.	REMARKS AND SPECIAL FEATURES	DIAL	RINGER	HANDSET	CIRCUIT DRAWING
55400 (LR) 00 D	Straight Cord	1900 (G) 450	Less Ringer	6500 (C) 410	21531
554** (LR) 02 D	Coiled Cord	19** (G) 450	Less Ringer	65** (C2) 410	21531
55400 (LR) 03 D	Straight Cord	1900 (D) 450	Less Ringer	6500 (C) 410	21569
554** (LR) 04 D	Coiled Cord	19** (D) 450	Less Ringer	65** (C2) 410	21569
55400 (LR) 00 N	Straight Cord	Dummy Plug	Less Ringer	6500 (C) 410	21531
554** (LR) 02 N	Coiled Cord	Dummy Plug	Less Ringer	65** (C2) 410	21531

**Color Coding. See Figure 6, Page 12, Section One for K-500 Desk Telephone.