

Kellogg Switchboard and Supply Company

CHICAGO 38, ILLINOIS



Kellogg

1000 SERIES MASTERPHONES TELEPHONE HANDBOOK

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TELEPHONE HANDBOOK

Kellogg

1000 SERIES MASTERPHONES



Kellogg Switchboard and Supply Company
6650 SOUTH CICERO AVENUE
CHICAGO 38, ILLINOIS

Kellogg

1000 SERIES MASTERPHONES



Compiled, Edited, and Produced by

Kellogg Switchboard and Supply Co.
6650 S. Cicero Ave., Chicago 38, Ill.
Branches: Los Angeles – San Francisco – Kansas City

Foreword

This is a practical handbook for the non-technical man. It covers in a simple manner how to install and maintain Kellogg No. 1000 Series Masterphones.

It is not intended that this handbook be a technical manual, but rather an easily understood guide to assist installers and maintenance men.

If technical information is desired, advise us of your particular problem and we will gladly furnish detailed information.

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6650 South Cicero Avenue
CHICAGO 38, ILLINOIS
U. S. A.

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Kellogg No. 1000 Type Desk Masterphone

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Kellogg No. D-1000 Type Desk Masterphone

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Kellogg No. 1100 Type Wall Masterphone



Kellogg No. D-1100 Type Wall Masterphone

SECTION I

INSTALLATION

SECTION I — INSTALLATION

GENERAL

The Kellogg No. 1000 Series desk type or No. 1100 Series wall type Masterphones are designed for common battery service but may be adapted for local battery service. All parts such as switch-hook, condenser, ringer and induction coil are mounted on one base assembly (see figure 1).



Figure 1 — Base Assembly

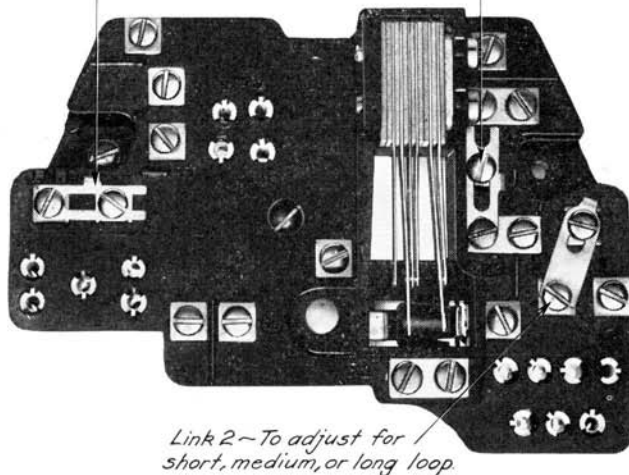
The Masterphone is adjusted to operate under normal line conditions before leaving the Kellogg Factory.

There are three adjustable links (see figure 2), which may be modified to adapt the telephone to particular requirements. They are as follows:

Link No. 1 is for changing the ringer circuit from metallic to divided (grounded) ringing (see figure 3).

Link 3 ~ To adjust position for 0.5 or 1.0 mf.

Link 1 ~ To adjust for divided or metallic ringing.



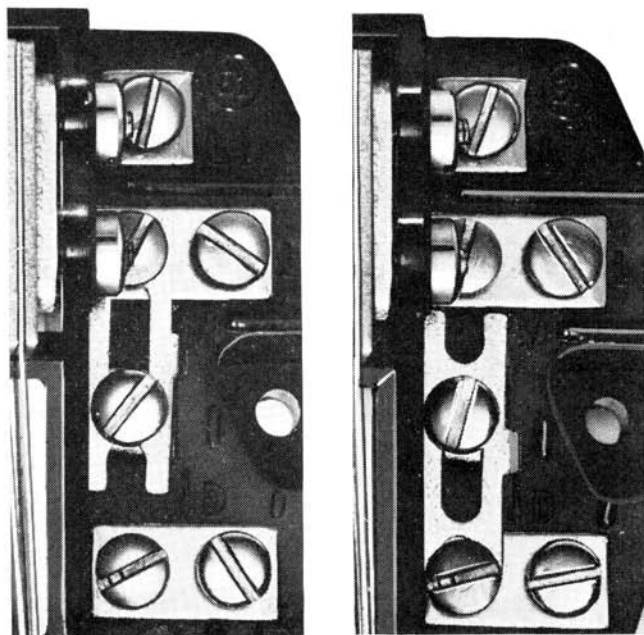
Link 2 ~ To adjust for short, medium, or long loop.

Figure 2 — Adjustable Links

Link No. 2 (figure 4) is for adjustment of the transmitter circuit to adapt it to a long or short loop (distance in ohms for central office).

Link No. 3 has two taps which adapt the condenser capaci-

ties to match the various type ringers used with these sets (see figure 5).



Metallic

Divided

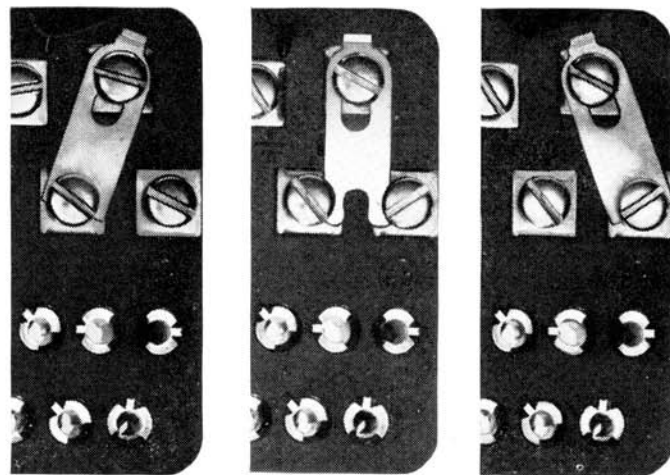
Figure 3 — Link No. 1

All common battery telephones are shipped from the Kellogg factory with the three links arranged for the following conditions:

Link No. 1—For metallic ringing

Link No. 2—For long loop conditions

Link No. 3—For condenser capacity to match ringer furnished with telephone (for example, 16 cycle, 1 mf.; 16 $\frac{2}{3}$ cycle, 1 mf.; 50 cycle, .5 mf.).



Short

Medium

Long

Figure 4 — Link No. 2

INSTALLATION PROCEDURE

No. 1—Determine frequency of ringer to be used (either 16, 16 $\frac{2}{3}$, 20, 25 cycle and so forth).

No. 2—Determine whether metallic or divided (grounded) ringing connection is required.

No. 3—Determine whether distance from central office will require a long or short loop connection.

No. 4—Refer to Charts No. 1, No. 2 and No. 3 for correct link connections.

No. 5—Make changes in link connections when necessary as determined from charts. (Charts No. 1, No. 2 and No. 3 follow on pages 8, 9 and 10.)

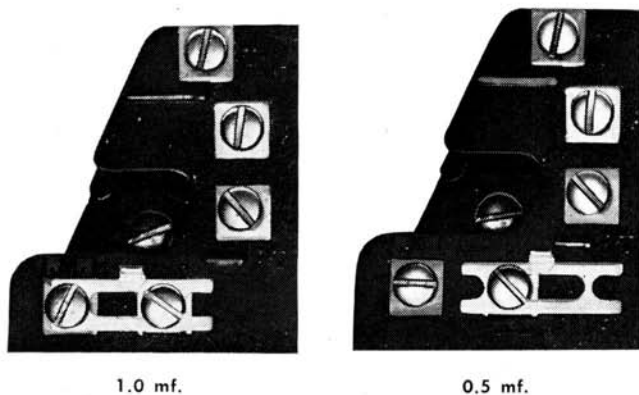


Figure 5 — Link No. 3

EXAMPLE USE OF CHARTS

This example provides for the installation of a common battery telephone equipped with a 42 cycle ringer, divided ringing, with a long loop connection.

Refer to Chart No. 1 42 cycle (*Column A*). Divided ringing (*Column B*). We find the position of Link No. 1 should be on "D" position (*Column C*). Link No. 2 in position 2 or 3 and Link No. 3 in position marked .5 mf.

The same procedure should be followed for various cycle ringers as shown on this chart for common battery service.

This procedure applies to Chart No. 2 except that the location of the No. 2 link is always in the No. 1 position.

NOTE: See note under charts 1 and 2 for divided ringing.

NOTE: See chart 3 for common and local battery sets using desk set boxes (old style with ringer, condenser and induction coil).

Common Battery (Combined Sets Only)

CHART 1
Print No. 21258

| A Cycle of Ringer | B Type of Ringing | C Position of Link 1 | D Position of Link 2* | | E Position of Link 3 |
|--------------------------------|-------------------------|----------------------------|--------------------------|-----------|----------------------------|
| | | | Short Loop | Long Loop | |
| 16 | Metallic | M | 1 | 2 or 3 | 1 mf. |
| 16 | Divided | D | 1 | 2 or 3 | 1 mf. |
| 16 ² / ₃ | Metallic | M | 1 | 2 or 3 | 1 mf. |
| 16 ² / ₃ | Divided | D | 1 | 2 or 3 | 1 mf. |
| 20 | Metallic | M | 1 | 2 or 3 | 1 mf. |
| 20 | Divided | D | 1 | 2 or 3 | 1 mf. |
| BA & SA | Metallic | M | 1 | 2 or 3 | .5 mf. or 1 mf. |
| BA | Divided | D | 1 | 2 or 3 | .5 mf. or 1 mf. |
| BB & SB | Metallic | M | 1 | 2 or 3 | 1 mf. |
| BB | Divided | D | 1 | 2 or 3 | 1 mf. |
| BC & SC | Metallic | M | 1 | 2 or 3 | 1 mf. |
| BC | Divided | D | 1 | 2 or 3 | 1 mf. |
| 25 | Metallic | M | 1 | 2 or 3 | .5 mf. |
| 25 | Divided | D | 1 | 2 or 3 | .5 mf. |
| 30 | Metallic | M | 1 | 2 or 3 | .5 mf. |
| 30 | Divided | D | 1 | 2 or 3 | .5 mf. |
| 33 ¹ / ₃ | Metallic | M | 1 | 2 or 3 | .5 mf. |
| 33 ¹ / ₃ | Divided | D | 1 | 2 or 3 | .5 mf. |
| 42 | Metallic | M | 1 | 2 or 3 | .5 mf. |
| 42 | Divided | D | 1 | 2 or 3 | .5 mf. |
| 50 | Metallic | M | 1 | 2 or 3 | .5 mf. |
| 50 | Divided | D | 1 | 2 or 3 | .5 mf. |
| 54 | Metallic | M | 1 | 2 or 3 | .5 mf. |
| 54 | Divided | D | 1 | 2 or 3 | .5 mf. |
| 60 | Metallic | M | 1 | 2 or 3 | .5 mf. |
| 60 | Divided | D | 1 | 2 or 3 | .5 mf. |
| 66 | Metallic | M | 1 | 2 or 3 | .5 mf. |
| 66 | Divided | D | 1 | 2 or 3 | .5 mf. |
| 66 ² / ₃ | Metallic | M | 1 | 2 or 3 | .5 mf. |
| 66 ² / ₃ | Divided | D | 1 | 2 or 3 | .5 mf. |

NOTE: For divided ringing a three (3) conductor cord must be used.

*Using Code No. 113-A Induction Coil.

Magneto (Local Battery), or Common Battery
Signalling and Local Battery Talking
(Combined Sets Only)CHART 2
Print No. 21258

| A Cycle of Ringer | B Type of Ringing | C Position of Link 1 | D Position of Link 2* | E Position of Link 3 |
|--------------------------------|-------------------------|----------------------------|-----------------------------|----------------------------|
| | | | | |
| 16 | Divided | D | 1 | 1 mf. |
| 16 ² / ₃ | Metallic | M | 1 | 1 mf. |
| 16 ² / ₃ | Divided | D | 1 | 1 mf. |
| 20 | Metallic | M | 1 | 1 mf. |
| 20 | Divided | D | 1 | 1 mf. |
| BA & SA | Metallic | M | 1 | .5 mf. or 1 mf. |
| BA | Divided | D | 1 | .5 mf. or 1 mf. |
| BB & SB | Metallic | M | 1 | 1 mf. |
| BB | Divided | D | 1 | 1 mf. |
| BC & SC | Metallic | M | 1 | 1 mf. |
| BC | Divided | D | 1 | 1 mf. |
| 25 | Metallic | M | 1 | .5 mf. |
| 25 | Divided | D | 1 | .5 mf. |
| 30 | Metallic | M | 1 | .5 mf. |
| 30 | Divided | D | 1 | .5 mf. |
| 33 ¹ / ₃ | Metallic | M | 1 | .5 mf. |
| 33 ¹ / ₃ | Divided | D | 1 | .5 mf. |
| 42 | Metallic | M | 1 | .5 mf. |
| 42 | Divided | D | 1 | .5 mf. |
| 50 | Metallic | M | 1 | .5 mf. |
| 50 | Divided | D | 1 | .5 mf. |
| 54 | Metallic | M | 1 | .5 mf. |
| 54 | Divided | D | 1 | .5 mf. |
| 60 | Metallic | M | 1 | .5 mf. |
| 60 | Divided | D | 1 | .5 mf. |
| 66 | Metallic | M | 1 | .5 mf. |
| 66 | Divided | D | 1 | .5 mf. |
| 66 ² / ₃ | Metallic | M | 1 | .5 mf. |
| 66 ² / ₃ | Divided | D | 1 | .5 mf. |

NOTE: For divided ringing a three (3) conductor cord must be used.

*Using Code No. 114-A Induction Coil.

**Common Battery and Local Battery
Using Desk Set Boxes (Old style with ringer,
condenser and induction coil)**

CHART 3

Print No. 21260

| A | B | C | D | | E |
|-----------------------|-----------------------|--------------------------|--------------------------|----------------|--------------------------|
| Cycle of Ringer | Type of Ringing | Position of Link 1 | Position of Link 2 | | Position of Link 3 |
| Does not apply | Does not apply | Not used | Short Loop 1 | Long Loop 1 | Not used |

**To Remove Housing on No. 1000 and
No. 1100 Series Masterphones**

Desk Masterphones (1000 Series)

Back out screw recessed in the front end of the base plate as illustrated in figure 6. Swing housing upward away from the base plate and then disengage from the projection located at the rear end of the base plate (see figure 7). Re-

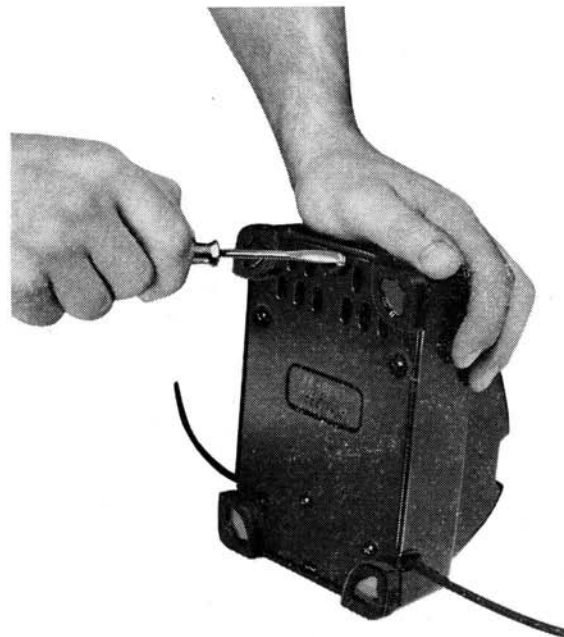


Figure 6 — Loosening Housing Screw

move the dial plug from the interconnecting block (*figure 8*) on dial telephones and the Press-to-Talk leads on Press-



Figure 7 — Removing Desk Housing

to-Talk telephones. The housing is then completely disconnected and may be set aside. On manual telephones no circuit disconnections are required for this operation.



Figure 8 — Removing Dial Plug

Wall Masterphones (1100 Series)

To remove housing pull the projection (*figure 9*) located between the sound holes on the bottom of the housing forward until the catch disengages the base plate and the lower

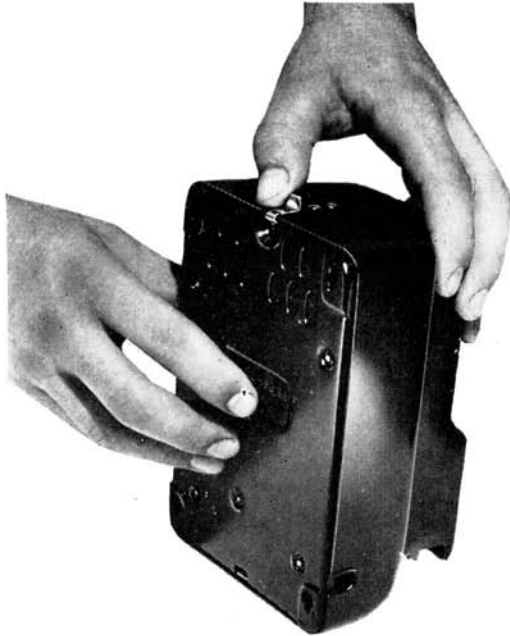


Figure 9 — Pulling Housing Projection

part of the housing can be moved away from the base plate. With the top as a hinge, swing the housing upwards until the housing is disengaged from the base plate projection (*see figure 10*).

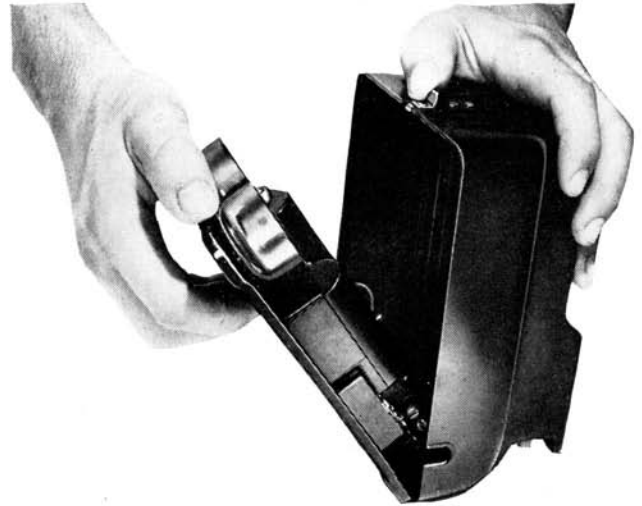


Figure 10 — Removing Wall Housing

Remove the dial plug from the interconnecting block on dial telephones (*figure 8*) and the Press-to-Talk leads on Press-to-Talk telephones. The housing is then completely disconnected and may be set aside. On manual telephones no circuit disconnections are required for this operation.

Assembling Housing on No. 1000 and No. 1100 Series Masterphones

Desk Masterphones (1000 Series)

Be sure that all parts previously disconnected have been properly reconnected and cords and wiring dressed within the instrument to avoid interference with moving parts.

Step 1—Invert the housing and base plate.

Step 2—Hold base plate at a slight angle so that the ringer gongs do not strike the housing.

Step 3—Slide the base plate so the projecting ear enters the opening in the housing catch.

Step 4—Locate the line and handset cord in openings provided and close set.

Step 5—Engage screw and tighten with a screw driver.

Wall Masterphones (1100 Series)

Before replacing the housing check that all parts previously disconnected have been properly reconnected. Cords and wiring should be dressed within the instrument to avoid interference with moving parts.

Step 1—Place the base plate in a vertical position.

Step 2—Hold the housing at a slight angle so that it clears the ringer gongs.

Step 3—Center the top of the housing over and above the top side of the base plate assembly.

Step 4—Move the housing downward until the projecting ear of the base enters the opening in the housing catch.

Step 5—Move the lower portion of the housing toward the base plate. After contact apply sufficient pressure on the lower portion to engage the spring catch.

When the spring catch engages the base plate it will be accompanied by a distinct "snap." Check by pulling forward on the housing. When properly engaged it will be locked securely at both top and bottom.

TESTS AFTER INSTALLATION

Talking and Listening Tests

In a normal tone of voice with the mouthpiece directly in front of and within one inch of the lips talk to the central office operator, wire chief or other designated persons. The telephone should provide good transmission and reception with little side tone.

If side tone and transmission qualities (on common battery telephones only) are not as desired, move Link No. 2 (*figure 4*) to Position 1, 2 or 3, leaving it in the location which provides the best transmission.

Ringling Tests, Precautions and Adjustments

Obtain a ring back over the line and check for proper operation of the ringer.

On bridged-selective ringing, observe that no other station bells operate on the assigned frequency of station being installed.

On desk Masterphones connected for divided (grounded) ringing, where the ringer does not operate, reverse line wires (inside wires) L1 and L2 (*figure 11*) at the terminal block at the junction of the cord and the inside wire.

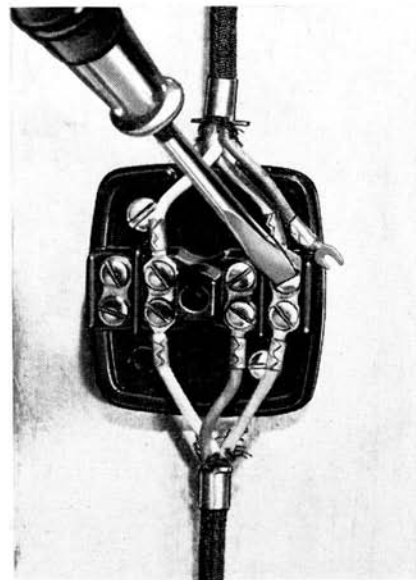


Figure 11 — Reversing Line Wires on Terminal Block

For divided (grounded) ringing on wall Masterphones where the ringer does not operate, reverse the line wires (inside wires L1 and L2 (*figure 12*) at the terminal block on the base assembly.

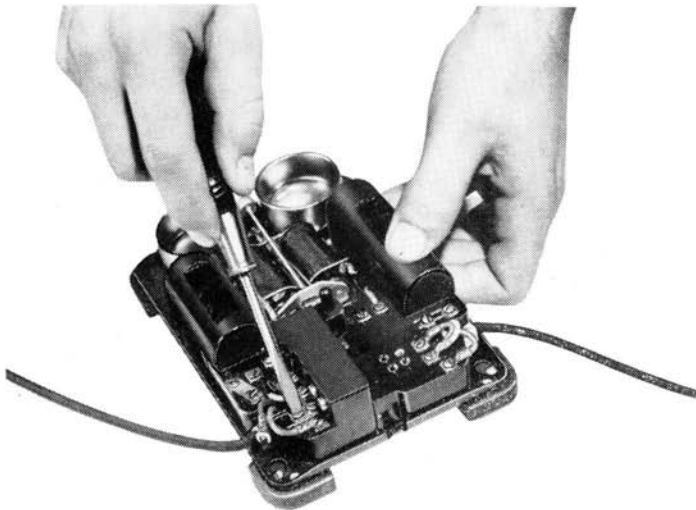


Figure 12 — Reversing Line Wires on Base Assembly

When pulsating super-imposed ringing is used in con-

nection with the vacuum tube for station selection it will be necessary to determine the correct connection for Line 1 and Line 2 and the proper polarity of the ringers as well. If necessary this may be done by reversing the Line 1 and Line 2 leads (*figure 11*), and the red and black leads of the



Figure 13 — Reversing Ringer Leads

ringer (*figure 13*). Another method would be to determine the tip or ring of the line through use of a handset and connect the side over which the telephone will be rung to the L1 lead. The normal connection is the red wire from

the ringer connecting to Link No. 3 (R_1) and the black wire from the ringer to R_2 (—) negative currents. When the ringer leads are reversed (that is, the black wire of the ringer Link No. 3 (R_1) and red wire of ringer to R_2), the ringer is connected for positive (+) currents.

If bell tapping occurs in dial telephones using biased ringers, reverse the red and black ringer leads (see figure 13). Where it is found that reversing the ringer leads does

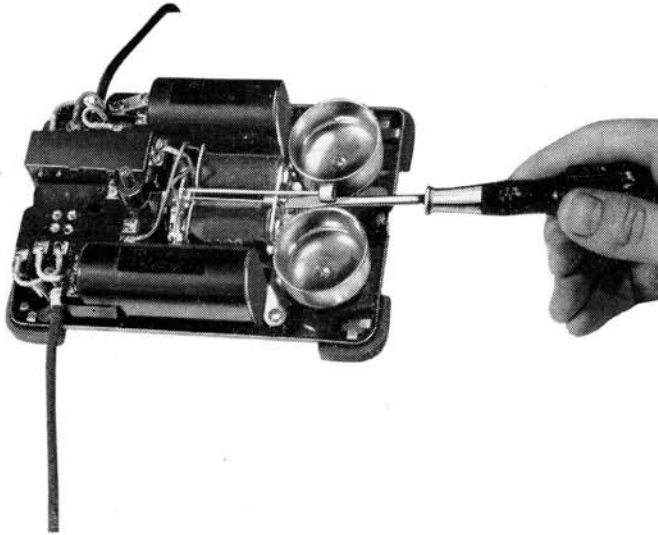


Figure 14 — Increasing Bias Tension

not correct the condition connect them for the least disturbing tapping and increase the bias tension (figure 14).

Bias tension should not be greater than necessary since excessive tension affects the quality of the ring.

No corrective measures can be taken to prevent tapping when straight line (SA-SB-SC) ringers are used.

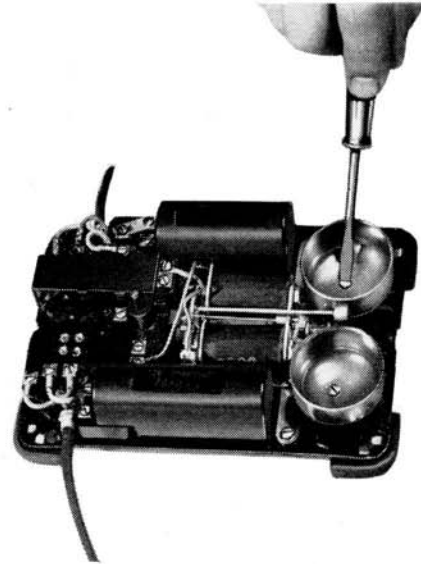


Figure 15 — Adjusting Ringer Gongs

If the ringer does not operate properly, minor adjustments can be made by loosening the gong mounting screws slightly so that the gongs may be rotated until the desired ringing tone is obtained. Hold the gongs securely, tighten the mounting screws (see figure 15) and retest for ringing as the gong positions may have been altered during the tightening.

SECTION II

**COMMON BATTERY
MAINTENANCE
AND TROUBLE CLEARING**

**SECTION II — COMMON BATTERY
MAINTENANCE AND TROUBLE CLEARING**

GENERAL

A voltmeter test should be made on all lines on which a subscriber's report of trouble has been received. A large number of troubles which affect the operation of station equipment are found in other classes of plant associated with the subscriber's circuit. These troubles should be cleared before the final test is made at the station.

As a rule trouble clearing at the subscriber's premises should be limited to those cases which can easily be corrected and repaired. When in doubt, replace the instrument.

REPORTED TROUBLE

Traced to Station Equipment

Remove the housing from the Masterphone so that the component parts of the base assembly are accessible. Disconnect the interior wire on the wall Masterphone, or the line cord on the desk Masterphone (*figure 16*) from the L₁,

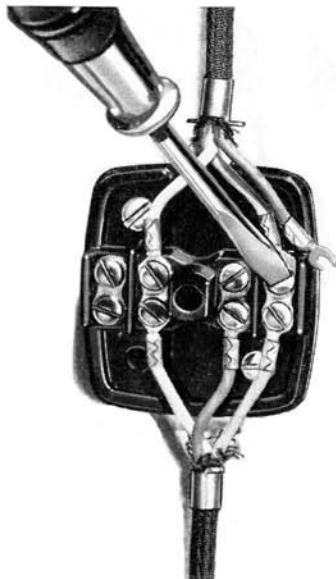


Figure 16 — Disconnecting Line Leads

L₂ and ground terminals on the connecting block, and again determine if the line is normal toward the central office. If the line is clear, the trouble is likely to be in the telephone instrument.

Can't Be Heard

The following procedure will localize the fault. Test after each step before proceeding to the next one.



Figure 17 — Replacing Transmitter

Step 1—Replace the transmitter capsule with one known to be good and determine that the mouthpiece is satisfactory (*see figure 17*).

Step 2—Check that Link 2 (*figure 4*) is in the correct position for the station involved. Refer to Chart No. 1.

Step 3—Defective Induction Coil. Replace induction coil (Code No. 113A) with one known to be satisfactory (see *figure 18*).

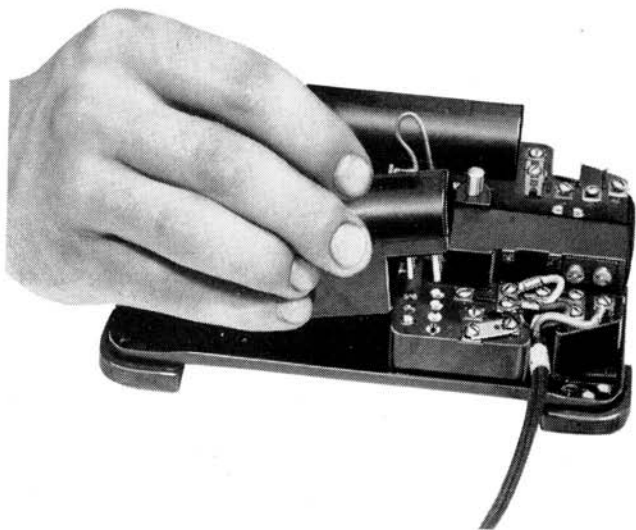


Figure 18 — Replacing Induction Coil

Step 4—Replace the complete telephone with one known to be satisfactory. If this does not clear the fault recheck toward the central office for other sources of trouble.

Can't Hear (Poor or No Reception)

The following procedure will localize the fault. Test after each step before proceeding to the next one.



Figure 19 — Replacing Receiver

Step 1—Damaged receiver or ear cap. Replace the capsule with one known to be good (*figure 19*). Be sure that proper ear cap is used. The proper cap is one which screws flush with the handset receiver recess.

Step 2—Defective condenser. Replace the condenser with one known to be good (*see figure 20*).

Step 3—Defective induction coil. Replace the induction coil (Code No. 113A) with one known to be good (*see figure 18*).

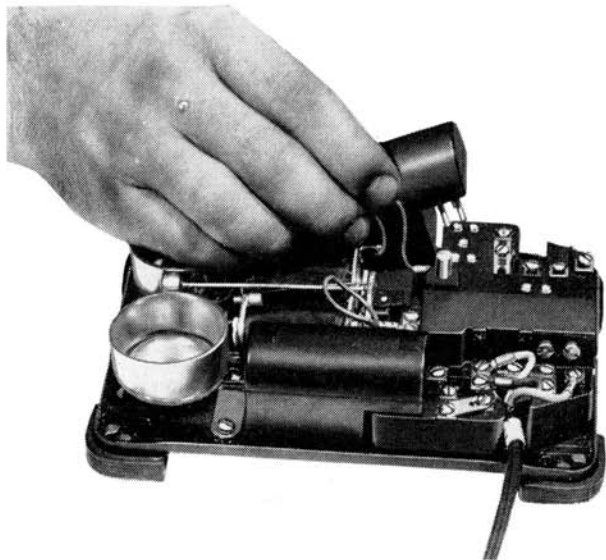


Figure 20 — Replacing Condenser

Step 4—Replace the complete telephone with one known to be satisfactory. If this does not clear the trouble recheck toward the central office for other sources of trouble.

Intermittent Operation or Noises

This trouble is usually caused by loose assemblies, connections or broken wires and cords.

The following procedure will localize the fault. Test after each step before proceeding to the next one.

Step 1—Bend and shake line and handset cords. Move or tap the various circuit elements such as dial, condenser and induction coil for loose connections. Check screws holding the links for tightness.

Step 2—Replace the complete telephone set with one known to be satisfactory. If this does not clear the fault, recheck toward the central office for other sources of trouble.

Ringer Trouble

Telephone ringer trouble may be caused by various conditions, but a very simple test will disclose the source. Be sure and check that the proper frequency ringer is installed. Determine if Link 3 (*figure 5*) is in the correct position for the ringer involved, and that Link 1 (*figure 3*) is connected for either metallic or divided (grounded) ringing as required. See Chart No. 1.

All ringers are factory adjusted to operate on average voltages most commonly used. They are equipped with an adjustment screw to adjust air gaps between the armature and the pole pieces. This adjustment is provided to compensate for various ringing voltages.

Bells Don't Ring—The following procedure will localize the fault. Test after each step before proceeding to the next one.

Step 1—Open condenser. Replace with one known to be good (*see figure 20*).

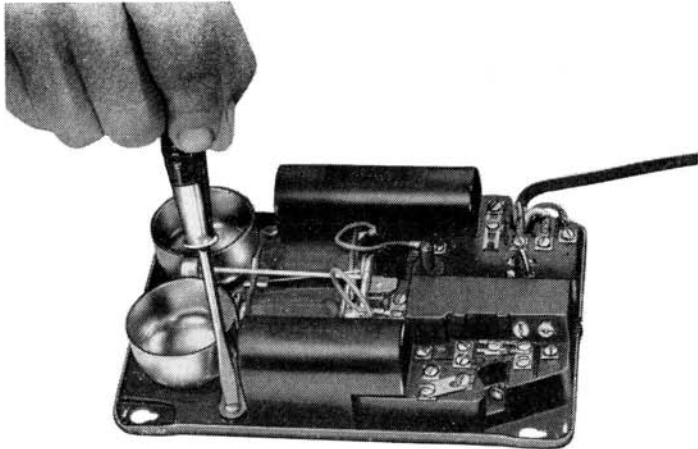


Figure 21 — Removing Ringer Screw

Step 2—Defective ringer. Replace ringer with one known to be good, and of the correct frequency and resistance (*see figure 21*).

Step 3—Replace the complete telephone with one known to be satisfactory. If this does not clear the fault, recheck toward the central office for other sources of trouble.

Bells Ring Too Loud or Bells Don't Ring Loud Enough—

Biased & Straight Line Ringers—The following procedure will help localize the fault. Test after each step before proceeding to the next one.



Figure 22 — Adjusting Gong Spacing

Step 1—Check the gong adjustment by holding first one and then the other side of the armature against its respective pole piece (*see figure 22*).

Step 2—Adjust the space between the gong and the clapper to approximately $\frac{1}{32}$ inch by rotating each gong about its mounting screw until the desired spacing of $\frac{1}{32}$ inch is attained. Slight deviations from the $\frac{1}{32}$ inch spacing may be made for louder or softer ringing.

Step 3—Adjust the tension on the biased ringers with a minimum amount of tension to prevent tapping (see figure 23).

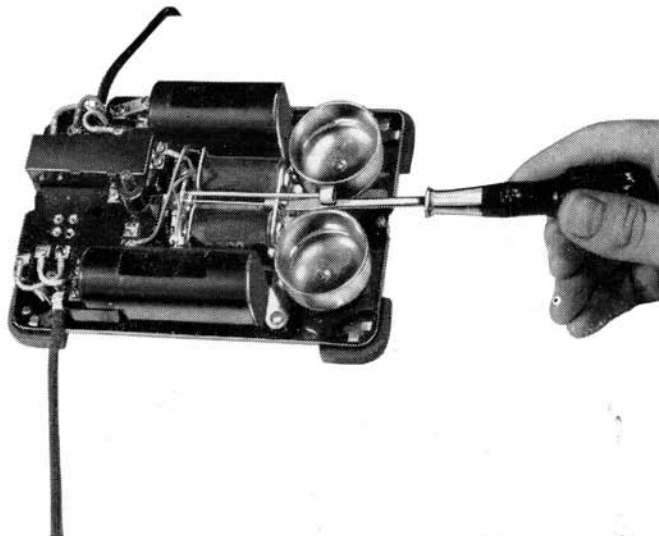


Figure 23 — Adjusting Tension on Biased Ringers

Step 4—Test the ringer and be sure that the clapper strikes both gongs and gives a satisfactory ring.

Step 5—Replace the complete telephone with one known to be satisfactory. If this does not clear the trouble, recheck toward the central office for other sources of trouble.

Harmonic Ringers—Merely adjust the gong spacing for the desired tone quality (see figure 22).

Bell Tapping—The following procedure will help to localize the fault. Test after each step before proceeding to the next one.

Step 1—Check code of ringer. If a straight line ringer is installed, replace with a biased ringer.

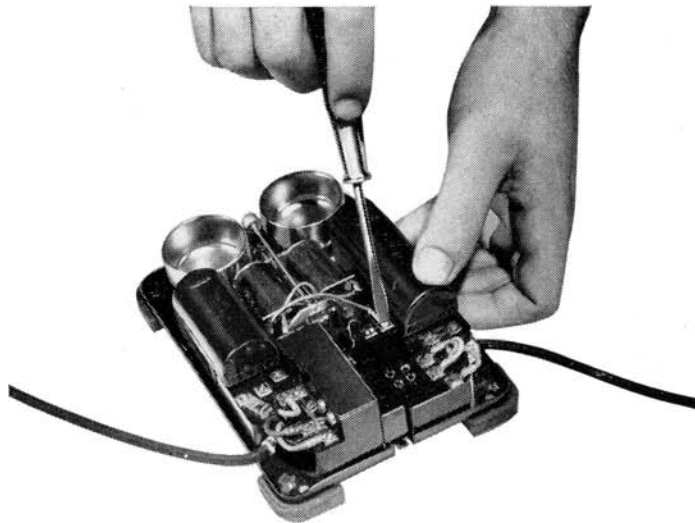


Figure 24 — Reversing Ringer Leads

Step 2—Reverse the ringer leads R1 and R2 on AC ringing systems (see figure 24). If this does not clear the trouble connect the ringer for the least objectionable tapping and increase the bias tension only to the point where bell tapping ceases (see figure 23).

SECTION III KELLOGG MASTER DIAL

SECTION III — KELLOGG MASTER DIAL

GENERAL

The Kellogg Master Dial has been properly adjusted after manufacture and should require a minimum of attention. The following servicing or adjusting may be performed by local repair or maintenance personnel if necessary.

- (a) Dial Number Card
- (b) Lubrication
- (c) Spring Contacts



Kellogg Master Dial

DIAL NUMBER CARD

The dial number card is mounted under a circular transparent protector in a retaining ring. To change the dial number card, remove the card retaining ring by rotating it

approximately 15° in either direction (see figure 25). Kellogg Code No. 86 Tool is available for removing and reassembling

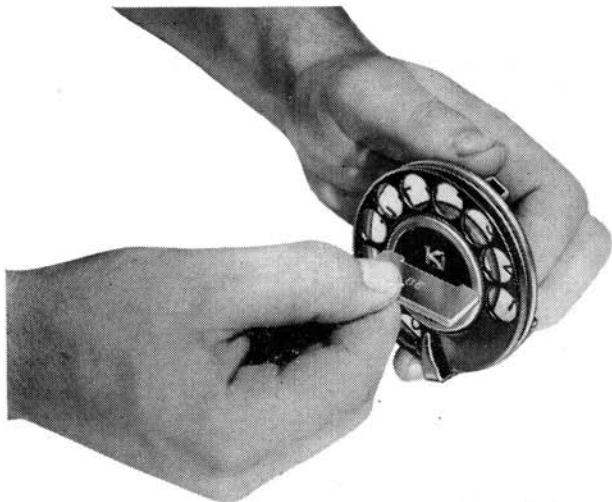


Figure 25 — Removing Dial Number Card

the dial retaining ring. The dial number card and transparent protector are notched in order that they can be

inserted in one position only in the retaining ring (see figure 26).



Figure 26 — Dial Card, Protector and Ring

To re-assemble, place the retaining ring assembly in the finger plate recess approximately 15° from its normal vertical position and rotate the ring to the normal vertical position.

LUBRICATION

If the dial ever becomes dry or sluggish, lubricate the six bearing points indicated in figures 27 and 28.

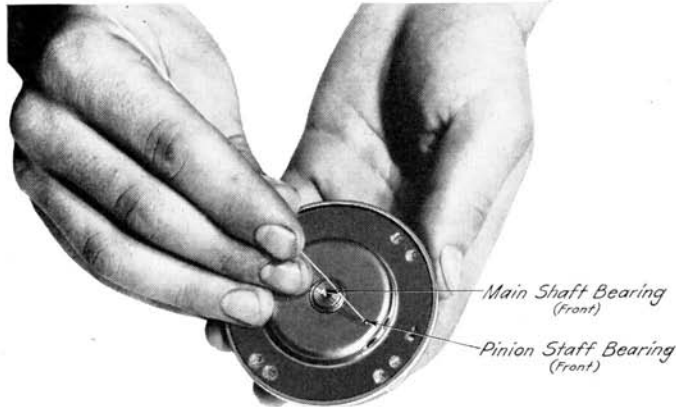


Figure 27 — Dial Lubrication Points (Front)

From the front of the dial, after removing the retaining ring, number card, and the finger plate, the top main shaft bearing and top pinion staff bearing can be lubricated (see figure 27).

From the rear of the dial, the lower main shaft bearing,

lower pinion staff bearing and the two governor shaft bearings can be lubricated (see figure 28).

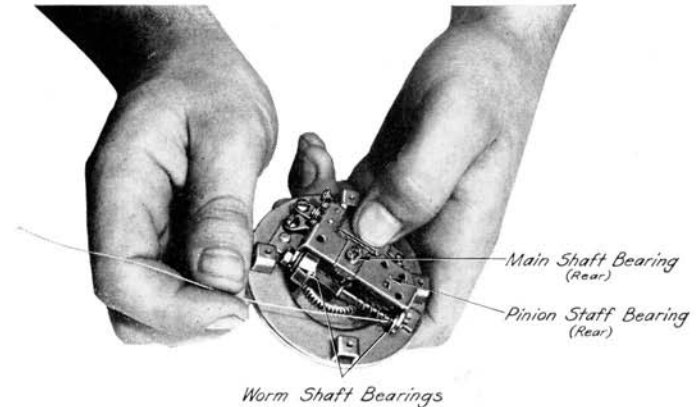


Figure 28 — Dial Lubrication Points (Rear)

Apply a drop of Kellogg Special Dial Lubricant to each of the bearings by means of a small applicator or a piece of clean bare wire approximately No. 20 B&S gauge. *Caution:* Use only *Kellogg Special Dial Lubricant* for this purpose.

SPRING CONTACTS

If the spring contacts are dirty or corroded use a Kellogg No. 68 Contact Burnisher to clean. Inserting the blade of the Burnisher between the two contacts and with normal spring pressure, burnish the contacts two or three times (*see figure 29*).

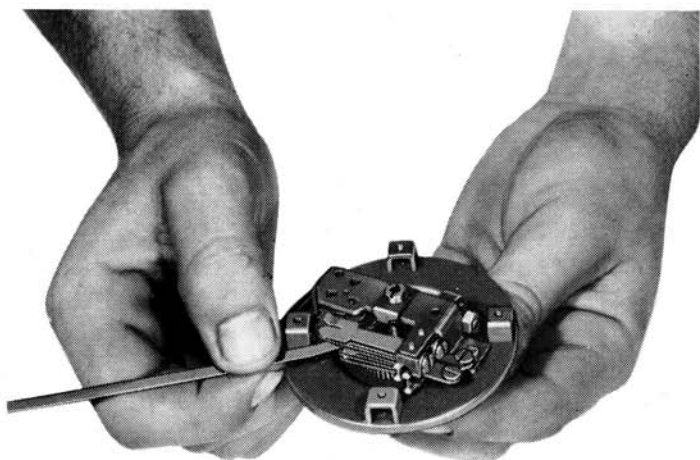


Figure 29 — Cleaning Spring Contact

It is recommended that any other adjustments be made by a person familiar with the Master Dial maintenance, who has all the tools and equipment needed to adjust it properly. Otherwise the dials should be returned to Kellogg for repair and adjustment.