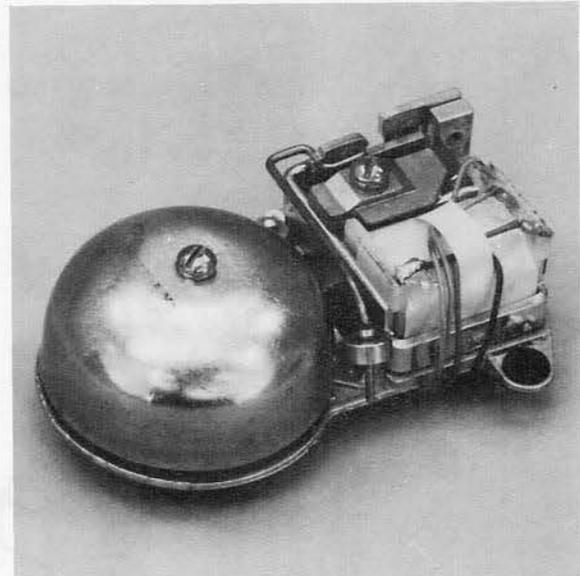


## MODEL 151 RINGER

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Figure 1: Model 151 Ringer

### 1. INTRODUCTION

**1.01** This document covers the Model 151 ringer. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

**1.02** Whenever this section is reissued, reason for reissue will be listed in this paragraph.

**1.03** For applications of the Model 151 ringer in telephones, refer to the appropriate section in Volume 1 of the ITT Telephone Apparatus Practices Manual.

### 2. GENERAL DESCRIPTION

**2.01** The Model 151 ringer (see Figure 2) is a miniature, single-gong, biased-type, frequency-selective ringer equipped with a mechanical volume control and assembled on a die-cast frame. A laminated soft-iron core holds the single-wound coil in place. Through the use of various clapper weights and capacitors, the ringer is tuned to ring at different specific frequencies.

**2.02** The armature and clapper assembly is spring-mounted to the ringer frame. The fluctuating magnetic field produced by the coil causes the ar-

mature to vibrate and the clapper to strike the gong. Increased sensitivity is provided by biasing the armature with a small permanent magnet.

**2.03** The ringer is mounted on two shock-absorbing rubber grommets located on the ringer frame.

**2.04** Frequency-selective ringers are divided into three classes. HA ringers are classed as harmonic. HB ringers are classed as synchrononic. HC ringers are classed as decimonic.

**2.05** The Model 151 ringer is identified by a code number printed on a ringer label attached to the gong. Refer to ordering information in Table A for an explanation of each code number and a list of available ringers.

### 3. REMOVAL

**3.01** To remove the ringer from the telephone, proceed as follows:

- (a) Remove the telephone housing.
- (b) Remove any telephone components that may obstruct access to the ringer.

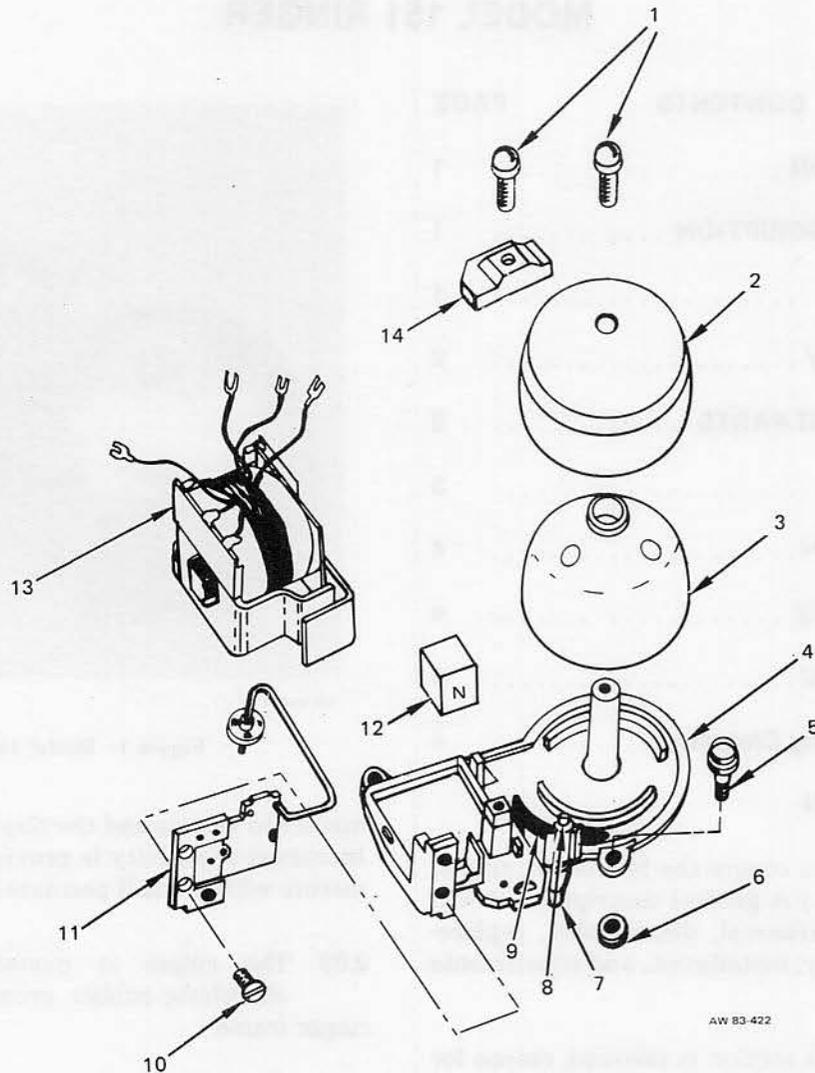


Figure 2: Model 151 Ringer, Exploded View

- (c) Disconnect the ringer leads.
- (d) Loosen the two frame mounting screws and lift the ringer from the telephone base.

#### 4. DISASSEMBLY

4.01 To disassemble the ringer, proceed as follows:

- (a) Loosen and remove the screw that holds the gong to the ringer frame.
- (b) Remove the gong and the resonator.
- (c) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (d) Loosen and remove the two screws that hold the armature and clapper assembly to the ringer frame.
- (e) Lift the armature and clapper assembly from the ringer frame.
- (f) Loosen and remove the screw that holds the retaining plate to the ringer frame. Remove the retaining plate.
- (g) Remove the magnet.

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TABLE A  
ORDERING INFORMATION

| CODE NUMBERS  |                  |        |                        |                            |                        |      |                        |
|---|------------------|--------|------------------------|----------------------------|------------------------|------|------------------------|
| RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS: |                  |        |                        |                            |                        |      |                        |
| (1) Ringer Model Number<br>(See Part 1)                 |                  | 000151 |                        | HA1                        |                        |      |                        |
| (2) Selective Frequency<br>(See Part 2)                 |                  |        |                        |                            |                        |      |                        |
| PART 1 RINGER MODEL NUMBER                              |                  |        |                        | PART 2 SELECTIVE FREQUENCY |                        |      |                        |
| CODE  | DESCRIPTION      | CODE   | FREQUENCY              | CODE                       | FREQUENCY              | CODE | FREQUENCY              |
| 000151  | Model 151 Ringer | HA1    | 33 1/3 Hz              | HB1                        | 30 Hz<br>(Same As HC3) | HC1  | 20 Hz                  |
|   |                  | HA2    | 50 Hz<br>(Same As HC5) | HB2                        | 42 Hz                  | HC2  | 60 Hz                  |
|   |                  | HA3    | 66 2/3 Hz              | HB3                        | 54 Hz                  | HC3  | 30 Hz<br>(Same As HB1) |
|   |                  | HA4    | 16 2/3 Hz              | HB4                        | 66 Hz                  | HC4  | 40 Hz                  |
|   |                  | HA5    | 25 Hz                  | HB5                        | 16 Hz                  | HC5  | 50 Hz<br>(Same As HA2) |

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(h) Lift the pole piece assembly from the ringer frame.

## 5. REPLACEMENT PARTS

**5.01** Replacement parts for the Model 151 ringer are listed in Table B. (Table B is located at the end of this section.)

## 6. ASSEMBLY

**6.01** To assemble the ringer, proceed as follows:

(a) Place the pole piece assembly on the ringer frame, checking for proper alignment with the locating pins on the ringer frame.

(b) Place the magnet securely against the pole piece assembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.

(c) Place the armature and clapper assembly into the gap of the pole piece assembly. Mount the armature and clapper assembly to the ringer frame using two screws.

(d) Position the retaining plate so that it rests against both the pole piece assembly and the magnet. Mount the retaining plate to the ringer frame using one screw.

- (e) Position the resonator on the ringer frame, and place the gong over the resonator.
- (f) Mount the gong to the ringer frame using one screw.

**7. INSTALLATION**

**7.01** To install the ringer inside a telephone, proceed as follows:

- (a) Position the ringer on the telephone base so that the two mounting holes in the ringer frame align with the mounting holes in the telephone base.

*Note:* The shock-absorbing rubber grommets must be in place in the ringer frame mounting holes.

- (b) Mount the ringer to the telephone base using two screws.

*Note:* The Model 151 ringer uses a series matching capacitor that creates a resonant circuit for a selected ringing frequency. (See Table C.) The capacitor required for the reso-

nant circuit is shipped loose with the ringer, and a 0.47 mfd capacitor is provided between network terminals A and K.

- (c) Connect the series matching capacitor across network terminals A and F if the required capacitor has a value other than 0.47 mfd. Refer to the telephone circuit label.

- (d) Connect the ringer coil assembly leads to the telephone network. Refer to the telephone circuit label.

**8. ADJUSTMENTS**

**Volume Control**

**8.01** Ringer volume is controlled by moving the tone lever to one of the three selector positions provided on the ringer frame.

**Clapper-to-Gong Clearance**

**8.02** Clearance between the clapper and the gong may vary, but it should be between 0.030 inch and 0.10 inch. Coarse adjustment is made by bending the clapper arm. Fine adjustment is made by rotating the gong.

TABLE C

RINGER SERIES CAPACITORS

| NETWORK TERMINALS | CAPACITANCE (MFD) | CODE SERIES                  |
|-------------------|-------------------|------------------------------|
| A-K               | 0.47              | HA4, HA5, HB5, HC1           |
| A-F               | 0.25              | HA1, HB1, HC3                |
| A-F               | 0.15              | HB2, HC4                     |
| A-F               | 0.08              | HA2, HA3, HB3, HB4, HC2, HC5 |

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TABLE B  
REPLACEMENT PARTS LIST

| INDEX NO | PART NUMBER | DESCRIPTION                                   | QUANTITY USED    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|----------|-------------|---|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|          |             |   | Model 151 Ringer |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|          |             |   | HA1              | HA2 | HA3 | HA4 | HA5 | HB1 | HB2 | HB3 | HB4 | HB5 | HC1 | HC2 | HC3 | HC4 | HC5 |
| 1        | 075408-102  | Screw With Lockwasher                         | 2                | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   |
| 2        | 075396-101  | Gong  | 1                | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 3        | 075372-101  | Resonator                                     | 1                | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 4        | 088480-104  | Frame   | 1                | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 5        | 095966-102  | Screw, Frame Mounting                         | 2                | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   |
| 6        | 088209-101  | Grommet, Rubber                               | 2                | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   |
| 7        | 180122-101  | Lever, Tone                                   | 1                | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 8        | 095972-101  | Nut, Push                                     | 1                | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 9        | 088884-101  | Spring, Damper                                | 1                | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 10       | 063975-101  | Screw, Armature And Clapper Assembly Mounting | 2                | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   |
| 11       | 088484-101  | Armature And Clapper Assembly                 | -                | -   | -   | -   | -   | -   | -   | -   | -   | -   | 1   | -   | -   | -   | -   |
| 11       | 088484-102  | Armature And Clapper Assembly                 | -                | -   | -   | -   | 1   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 11       | 088484-103  | Armature And Clapper Assembly                 | 1                | -   | -   | -   | -   | 1   | -   | -   | -   | -   | -   | -   | 1   | -   | -   |
| 11       | 088484-105  | Armature And Clapper Assembly                 | -                | 1   | -   | -   | -   | -   | 1   | -   | -   | -   | -   | -   | -   | -   | 1   |
| 11       | 088484-106  | Armature And Clapper Assembly                 | -                | -   | 1   | -   | -   | -   | -   | 1   | 1   | -   | -   | 1   | -   | 1   | -   |
| 11       | 088484-109  | Armature And Clapper Assembly                 | -                | -   | -   | 1   | -   | -   | -   | -   | -   | 1   | -   | -   | -   | -   | -   |
| 12       | 184176-101  | Magnet  | 1                | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 13       | 088481-103  | Pole Piece Assembly (Coil And Laminated Core) | 1                | -   | -   | 1   | 1   | 1   | -   | -   | -   | 1   | 1   | -   | 1   | -   | -   |
| 13       | 088481-104  | Pole Piece Assembly (Coil And Laminated Core) | -                | 1   | 1   | -   | -   | -   | 1   | 1   | 1   | -   | -   | 1   | -   | 1   | 1   |
| 14       | 088483-101  | Plate, Retaining                              | 1                | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
|          | 183603-101  | Capacitor, 0.47 MFD (Not Shown)               | -                | -   | -   | 1   | 1   | -   | -   | -   | -   | 1   | 1   | -   | -   | -   | -   |
|          | 183603-102  | Capacitor, 0.25 MFD (Not Shown)               | 1                | -   | -   | -   | -   | 1   | -   | -   | -   | -   | -   | -   | 1   | -   | -   |
|          | 183603-103  | Capacitor, 0.15 MFD (Not Shown)               | -                | -   | -   | -   | -   | -   | 1   | -   | -   | -   | -   | -   | -   | 1   | -   |
|          | 183603-104  | Capacitor, 0.08 MFD (Not Shown)               | -                | 1   | 1   | -   | -   | -   | -   | 1   | 1   | -   | -   | 1   | -   | -   | 1   |

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