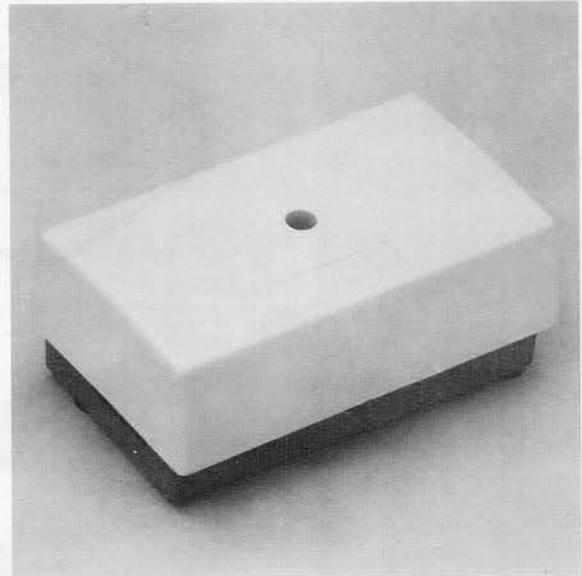


MODEL 147 RINGER

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Figure 1: Model 147 Ringer

1. INTRODUCTION

1.01 This document covers the Model 147 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.

2. GENERAL DESCRIPTION

2.01 The Model 147 ringer (see Figure 2) is a miniature, single-gong, biased-type, frequency-selective, extension ringer equipped with a mechanical volume control and assembled on a die-cast frame with a beige-colored, molded plastic cover. A laminated soft-iron core holds the double-wound coil in place. Through the use of various clapper weights and capacitors, the ringer is tuned to ring at a specific frequency.

2.02 The armature and clapper assembly is spring-mounted to the ringer frame. The fluctuating magnetic field produced by the coil causes the armature 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 three 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 147 ringer is identified by a code number stamped in ink on the back of the ringer frame. Refer to ordering information in Table A for an explanation of each code number and a list of available ringers.

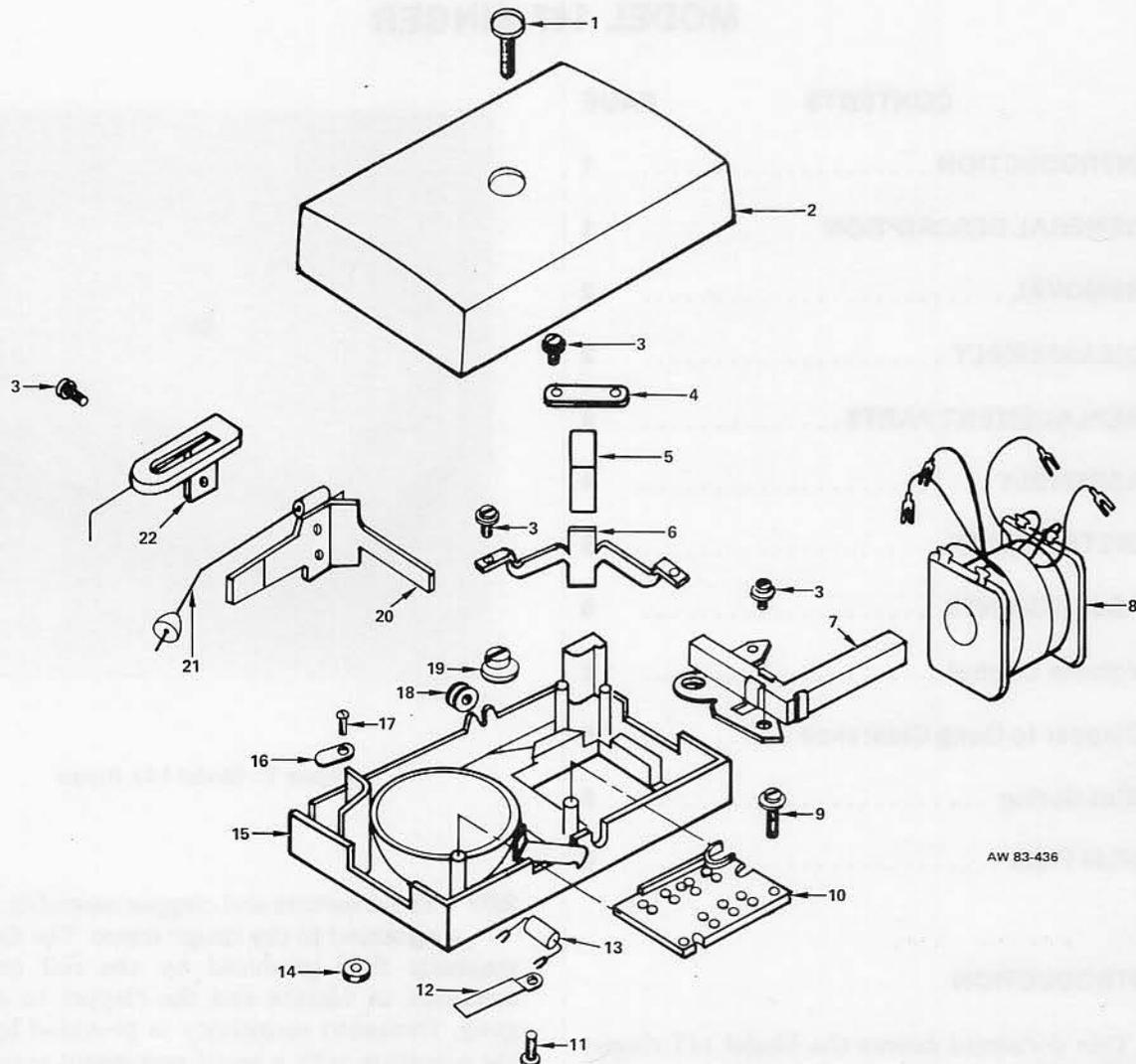


Figure 2: Model 147 Ringer, Exploded View

3. REMOVAL

3.01 To remove the ringer from its mounting location, proceed as follows:

- (a) Remove the cover from the ringer frame by loosening the cover mounting screw and lifting the cover.
- (b) Disconnect the ringer line cord leads coming into the ringer.
- (c) Loosen and remove the three ringer frame mounting screws.

4. DISASSEMBLY

4.01 To disassemble the ringer, proceed as follows:

- (a) Disconnect the coil assembly leads from the terminal board.
- (b) Disconnect the capacitor leads from the terminal board.
- (c) Loosen and remove the two screws that hold the terminal board to the ringer frame. Lift the terminal board from the ringer frame.

TABLE A
ORDERING INFORMATION

CODE NUMBERS							
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:							
(1) Ringer Model Number (See Part 1)		000147		HA1			
(2) Selective Frequency (See Part 2)							
PART 1 RINGER MODEL NUMBER				PART 2 SELECTIVE FREQUENCY			
CODE	DESCRIPTION	CODE	FREQUENCY	CODE	FREQUENCY	CODE	FREQUENCY
000147	Model 147 Ringer	HA1	33 1/3 Hz	HB1	30 Hz (Same As HC3)	HC1	20 Hz
		HA2	50 Hz (Same As HC5)	HB2	42 Hz	HC2	60 Hz
		HA3	66 2/3 Hz	HB3	54 Hz	HC3	30 Hz (Same As HB1)
		HA4	16 2/3 Hz	HB4	66 Hz	HC4	40 Hz
		HA5	25 Hz	HB5	16 Hz	HC5	50 Hz (Same As HA2)

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(d) Loosen and remove the two screws that hold the bias spring to the ringer frame. Lift the bias spring from the ringer frame.

(e) Lift the armature and clapper assembly from the ringer frame.

(f) 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.

(g) Loosen and remove the two screws that hold the clamping plate to the ringer frame. Lift the clamping plate from the ringer frame.

(h) Lift the magnet from the ringer frame.

(j) Loosen and remove the two screws that hold the shunt bar to the ringer frame. Lift the shunt bar from the ringer frame.

(k) Loosen and remove the screw that holds the slide plate and core assembly to the ringer frame.

(m) Lift the slide plate and core assembly from the ringer frame. Slide the coil assembly from the core laminations.

(n) Lift the slotted adjusting cam washer from the ringer frame.

(p) Loosen the screw on the back of the ringer frame, slide the retaining clip to one side, and lift the capacitor from the ringer frame.

5. REPLACEMENT PARTS

5.01 Replacement parts for the Model 147 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 (see Figure 3):

(a) Place the capacitor (see Table C) under the retaining clip on the back of the ringer frame and insert the capacitor leads through the slot in the ringer frame. Tighten the retaining clip mounting screw.

TABLE C

RINGER SERIES CAPACITORS

CAPACITANCE (MDF)	CODE SERIES
0.5	HA4, HA5, HB1, HB5, HC1, HC3
0.35	HA1
0.25	HB2, HC4
0.1	HA2, HA3, HB3, HB4, HC2, HC5

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(b) Place the slotted adjusting cam washer in the indentation provided on the ringer frame.

(c) Slide the coil assembly onto the laminated core and slide plate assembly, then position the core and slide plate assembly with the coil assembly onto the ringer frame. Ensure that the slide plate rests flat against the ringer frame in the tracks provided and that the slotted adjusting cam washer is positioned in the correct slide plate hole.

(d) Mount the slide plate to the ringer frame using one screw. Final adjustment of the slide plate is provided in paragraph 8.04.

(e) Position the shunt bar on the ringer frame and mount it to the ringer frame using two screws.

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

(g) Position the clamping plate over the magnet and mount it to the ringer frame using two screws.

(h) Place the armature and clapper assembly into the gap between the magnet and the mounting post on the ringer frame. Ensure that the armature return spring of the assembly is outside the mounting post.

(j) Position the bias spring on the mounting post, then align the mounting holes with the holes in the armature return spring and the holes in the mounting post.

(k) Mount the bias spring to the ringer frame using two screws.

Note: The bias spring must be positioned to the left of the clapper arm when viewing the ringer from the top.

(m) Position the terminal board on the ringer frame and mount it to the ringer frame using two screws.

(n) Connect the capacitor to the terminal board at terminals 5 and 7. (See Table C.)

(p) Connect the ringer coil assembly leads to the terminal board as follows:

- (1) Connect the SL-RD lead to terminal 1.
- (2) Connect the SL lead to terminal 1.
- (3) Connect the BK lead to terminal 6.
- (4) Connect the RD lead to terminal 7.

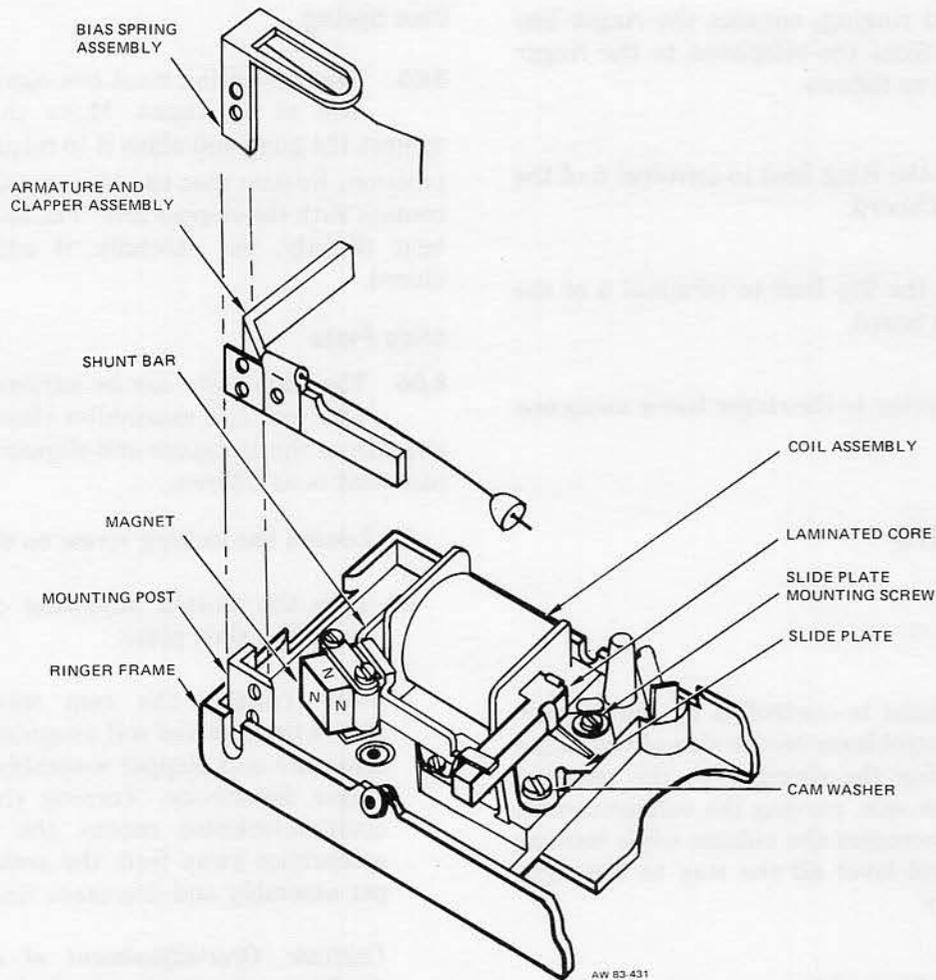


Figure 3: Model 147 Ringer Component Locations

7. INSTALLATION

Note: The Model 147 ringer is normally used as an extension ringer that connects across the Tip and Ring leads of a line at a connecting block; it is used with the original telephone ringer. The Model 147 ringer can also be used as an extension ringer for a subscriber with Tip Party Identification if the ringer inside the telephone is disconnected and the Model 147 ringer is connected at the telephone in place of the original ringer. Refer to the telephone circuit label for Tip Party Identification terminal connections.

7.01 To install the ringer on a wall or mounting board, proceed as follows:

- (a) Install the ringer line cord to a wall or through a hole in the wall if the line cord is to be hidden.
- (b) Mount the ringer to the wall using three screws. Ensure that the ringer line cord passes through either the slot in the back of the ringer frame or the slot in the top left-hand corner of the ringer frame. A cord retainer is provided in this corner for securing the line cord.

Note: The ringer must be installed with the side of the ringer frame nearest the armature and clapper assembly pointing upward. An indicating arrow is stamped in ink on the back of the ringer frame to aid in installation.

(c) For bridged ringing, connect the ringer line cord leads from the telephone to the ringer terminal board as follows:

- (1) Connect the Ring lead to terminal 5 of the terminal board.
- (2) Connect the Tip lead to terminal 6 of the terminal board.

(d) Install the cover to the ringer frame using one screw.

8. ADJUSTMENTS

Volume Control

8.01 Ringer volume is controlled by moving the volume control lever on the side of the ringer frame. When facing the ringer with the terminal board on the lower side, moving the volume control lever to the left increases the volume while moving the volume control lever all the way to the right silences the ringer.

Clapper-to-Gong Clearance

8.02 Coarse adjustment of the clapper-to-gong clearance for the Model 147 ringer is made by bending the clapper arm slightly.

Bias Spring

8.03 The bias spring must rest against the clapper arm at all times. Move the clapper arm against the gong and allow it to return to its normal position. Ensure that the bias spring does not lose contact with the clapper arm. The bias spring can be bent slightly, but carefully, if adjustment is required.

Slide Plate

8.04 The slide plate can be adjusted to move the core and coil assemblies closer to or farther away from the armature and clapper assembly. Adjustment is as follows:

- (a) Loosen the locking screw on the slide plate.
- (b) Turn the slotted adjusting cam washer to move the slide plate.

Note: Turning the cam washer clockwise moves the core and coil assemblies closer to the armature and clapper assembly and increases ringer sensitivity. Turning the cam washer counterclockwise moves the core and coil assemblies away from the armature and clapper assembly and decreases ringer sensitivity.

Caution: Over-adjustment of the slide plate produces cross-ringing (undesired ringing at a selective frequency other than the frequency that the ringer is tuned for).

- (c) When the desired adjustment is made, tighten the locking screw.

TABLE B
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED														
			HA1	HA2	HA3	HA4	HA5	HB1	HB2	HB3	HB4	HB5	HC1	HC2	HC3	HC4	HC5
		Model 147 Ringer															
1	190178-102	Screw, Cover Mounting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	190192-101	Cover	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	079259-102	Screw, Mounting	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
4	075563-101	Plate, Clamping	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	075562-102	Magnet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	075566-101	Bar, Shunt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	075578-101	Slide Plate And Lamination Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	185480-108	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	075408-102	Screw, Terminal Board Mounting	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	190188-101	Terminal Board Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	063261-103	Screw, Retaining Clip Mounting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	190472-101	Clip, Retaining	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	190440-103	Capacitor And Terminal Assembly	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13	190440-105	Capacitor And Terminal Assembly	—	1	1	—	—	—	—	1	1	—	—	1	—	—	1
13	190440-104	Capacitor And Terminal Assembly	—	—	—	1	1	1	—	—	—	1	1	—	1	—	—
13	190440-102	Capacitor And Terminal Assembly	—	—	—	—	—	—	1	—	—	—	—	—	—	1	—
14	075371-101	Foot, Rubber	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
15	190194-101	Frame And Gong Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	190181-101	Retainer, Cord	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	064127-101	Screw, Cord Retainer Mounting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	081958-101	Grommet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	075560-101	Washer, Slotted Adjusting Cam	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	075565-101	Armature	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	081056-102	Clapper Stem Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	183923-101	Bias Spring Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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