

RINGERS — NUMBERED TYPE MAINTENANCE

1.00 INTRODUCTION

This section covers procedures and requirements for maintaining numbered-type ringers and 392-type loud ringing bells.

2.00 GENERAL

2.01 At the time a station is placed in service, and on all subsequent visits, attention should be given to the proximity of other station

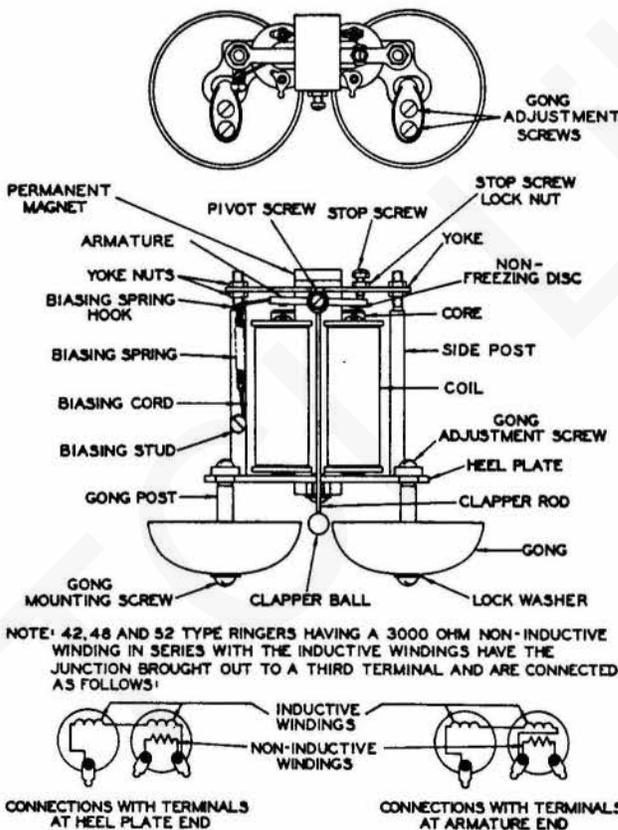


Fig. 1 — Typical Numbered Ringers

NOTE: 42 TYPE RINGERS ARE EQUIPPED WITH A BLACK LEAD ON THE BIASING SPRING SIDE AND A RED LEAD ON THE OTHER SIDE.
66 TYPE RINGERS HAVE GONG POSTS WHICH ARE BENT OUTWARD TO ACCOMMODATE 3 INCH GONGS.

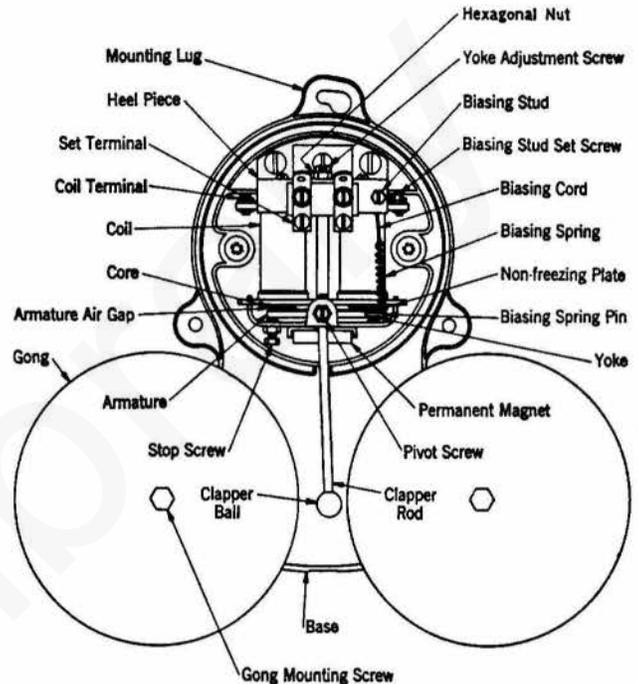


Fig. 2 — 392-type Subscriber Set (Loud Ringing Bell)

ringers. If necessary, gong changes should be made to aid the customer in identifying the line receiving the incoming calls.

2.02 Defective numbered-type ringers may be replaced with B-type ringers as provided for in the section entitled Ringers, B-type, Maintenance.

2.03 Fig. 1 illustrates typical numbered-type ringers and their component parts. Fig. 2 illustrates the 392-type loud ringing bell and its component parts.

3.00 MECHANICAL REQUIREMENTS

3.01 Armature stop springs which prevent sticking are provided for use on 38, 46, 47, 51, 55, and 65-type ringers (other than loud ringing bells) or where ringers are equipped with chromium-plated armatures or are unbiased (see Fig. 3).

3.02 The armature shall pivot freely on its pivots. End play between armature and its pivots should be just perceptible.

3.03 To adjust, loosen pivot screw locknut, using a 129B tool. Tighten or back off pivot screw, as required, with a screw driver. Holding pivot

screw firm with screw driver, tighten locknut. Recheck adjustment.

3.04 Tables A, B, and C and Figs. 4, 5, 6, and 7 show procedures, methods, and requirements necessary to check and adjust the airgap of numbered-type ringers.

4.00 GONG ADJUSTMENTS AND ATTACHMENTS**All Gongs Except 39A (Cathedral)**

4.01 Operate armature from side to side (by means of biasing hook, if present) holding it momentarily in extreme positions of its travel. Do not grasp clapper rod to operate armature. See that clapper ball strikes each gong to produce a single clear tone, but does not rest against either gong, except in the case of 392-type loud ringing bells where it is permissible to have clapper ball just touch the gongs at the end of each stroke. On ringers where the airgaps are changed from 0.035 inch and 0.012 inch to 0.060 inch and 0.012 inch, or vice versa, it may be necessary to bend clapper rod slightly to meet this requirement. If this is the case, a pair of long-nosed pliers should be used to bend rod close to armature. If clapper rod strikes coil or other part of ringer or, in wooden sets, the side of the hole through which the rod protrudes, the rod may be straightened or slightly bent, as required.

39A (Cathedral) Gongs (Used on 78-type Ringers Only)

4.02 The 39A cathedral-type gong is intended for use where a pleasing tone signal is desired. This gong may be used only on the 78-type ringer which is used in the 684-type subscriber set.

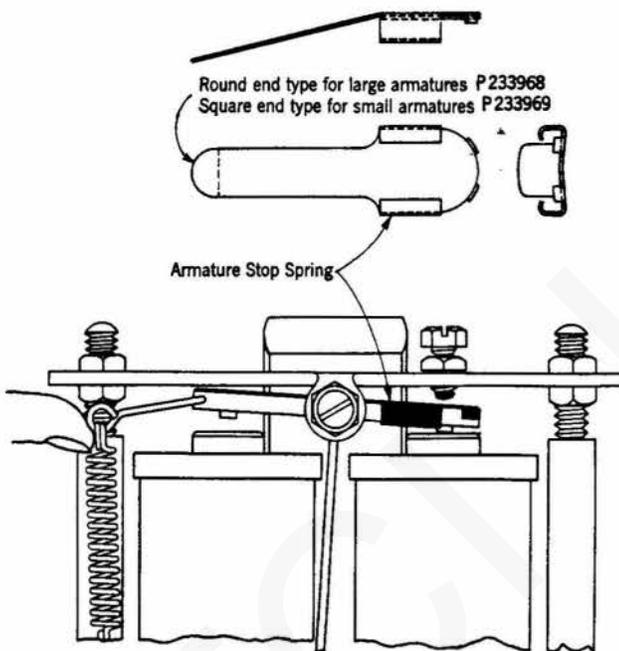


Fig. 3 — Armature Stop Spring

TABLE A
REQUIREMENTS

Ringer Types		When GO-NO GO Gauges Are Provided		Nominal Dimension of Airgaps	
		Biasing Spring Side	Stop Screw Side	Biasing Spring Side	Stop Screw Side
		Code of Gauge		Inch	
2, 6, 7, 8, 42, 48, 52, 66, 68, 72, 78	Biased, at 4-party full selective, and 8-party semiselective stations with relay sets and magneto grounded ringing party line stations rung with polarized current*	126D	126A	0.060	0.012
	Where relay sets are converted to electron tube sets, ringers need not be readjusted if stop screw side is 0.012 inch and biasing spring side is 0.030 to 0.065 inch. If, however, readjustment is required, bring airgaps within the requirements shown just below.				
	Biased, at all other common battery and magneto stations*	126C	126A	0.035	0.012
	Unbiased, at magneto stations	126A	126A	0.012	0.012
38, 46, 47, 51, 55, 65	Ringers with Solid Armature Stops (Fig. 5)*	126A (0.015 in. part)	126A (0.015 in. part)	0.016	0.016
38 and 51	Ringers with Flexible Armature Stops (Fig. 6)*	126B (0.020 in. part)	126B (0.020 in. part)	0.020	0.020
Loud Ringing Bells		Biasing Spring Side	Opposite Side	Biasing Spring Side	Opposite Side
		Code of Gauge		Inch	
392	Biased, at 4-party full selective and 8-party semiselective stations	126D	126A	0.060	0.012
	Biased, at all other stations	126B	126A	0.024	0.012
	Unbiased	126A	126A	0.012	0.012

* When reduced volume is desired at stations, use 127A (0.004 inch) gauge for minimum airgap on stop screw side. On ringers equipped with flexible armature stops, this dimension shall be measured with the stop on the side not being gauged just touching the pole piece.

TABLE B

ADJUSTMENT METHODS

Ringer Types	Remarks
2, 6, 7, 8, 42, 48, 52, 66, 68, 72, 78	(a) Adjust airgap on biasing spring side by means of yoke nuts. (b) Adjust airgap on stop screw side by means of stop screw.
38, 46, 47, 51, 55, 65	(a) Adjust yoke by means of yoke adjustment screw with screw driver so that gauge fits either airgap on ringers having solid armature stops. (b) When ringers have flexible armature stops, deflect stops fully against armature.
392 Loud Ringing Bell	(a) Adjust airgap on biasing spring side by means of yoke adjusting screw so that blade fits in gap as illustrated in Fig. 7. If there is a stop screw on biasing spring side, remove it. (b) Do not disturb hexagonal nut associated with yoke adjustment screw. (c) Adjust on other side by means of stop screw (see Fig. 7).
All	(a) Move gongs as required to facilitate measurement of airgaps.

TABLE C

APPLICATION OF GAUGES

Ringer Types	Remarks
All	Apply gauges as shown in Figs. 4, 5, 6, and 7 while applying slight pressure on biasing spring hook.
All	Requirements are met when GO (thin) part of blade enters easily, and the NO-GO (thick) part does not enter without forcing.
38, 46, 47, 51, 55, 65	Having solid armature stops NO-GO of 126A shall enter with slight looseness.
38, 51	Having flexible stops GO 126B shall enter with slight friction.
All	When GO-NO GO gauges are not available, gauges such as 37B, 38B, or 43-type may be used. Blade may enter with a slight looseness or with slight friction.

4.03 To use the 39A cathedral gong, remove the regular gongs from 78-type ringer, retaining the two gong mounting screws. Using these two screws attach 39A gong to ringer by its mounting plate.

- Loosen gong adjustment screws just enough to permit swinging the spiral steel gongs with some friction.
- With some tension on biasing spring so that clapper rod is held toward stop screw side, swing the spiral steel gong on stop screw side so that it clears clapper ball by approximately 0.020 inch. (Check visually. This adjustment is for preliminary guidance only.)
- With the clapper rod held toward the biasing spring side by applying upward finger pressure to the biasing hook, swing gong on the biasing spring side so that it clears clapper ball by approximately 0.012 inch. (Check visually. This adjustment is for preliminary guidance only.)
- Obtain ring and see that both gongs are being struck. If a rattling sound is heard, one or both gongs may be too close to the clapper, or too far away. If necessary, adjust each gong as required until satisfactory ringing is obtained, as judged by the sound. Tighten all gong adjustment screws securely, and recheck to see that sound is still satisfactory.

Fig. 6—Method of Checking Airgaps on 38- and 51-type Ringers Equipped With Flexible Armature Stops

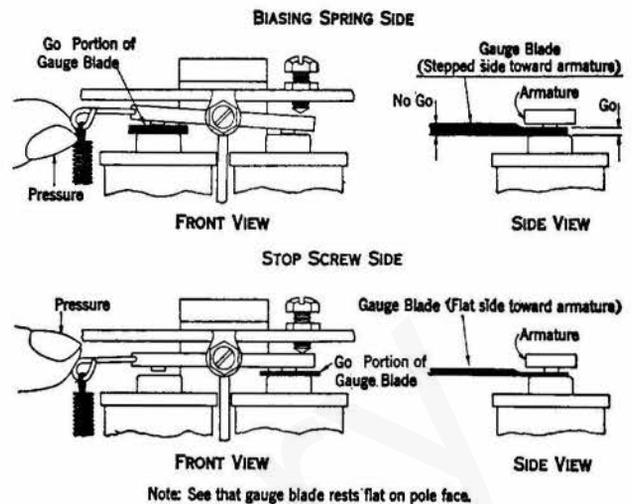


Fig. 4—Method of Checking Airgaps on Ringers of Types 2, 6, 7, 8, 42, 48, 52, 66, 68, 72, and 78

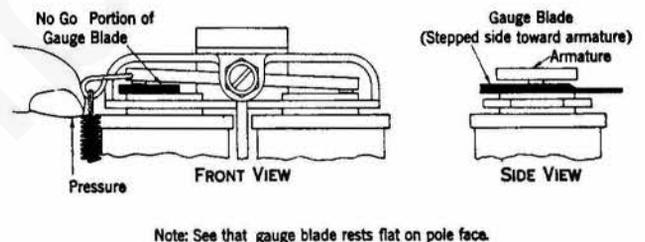
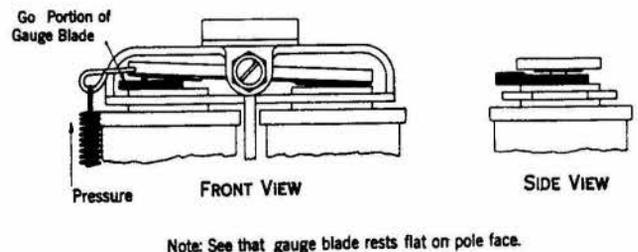


Fig. 5—Method of Checking Airgaps on Ringers of Types 38, 46, 47, 51, 55, and 65 Which Have Solid Armature Stops



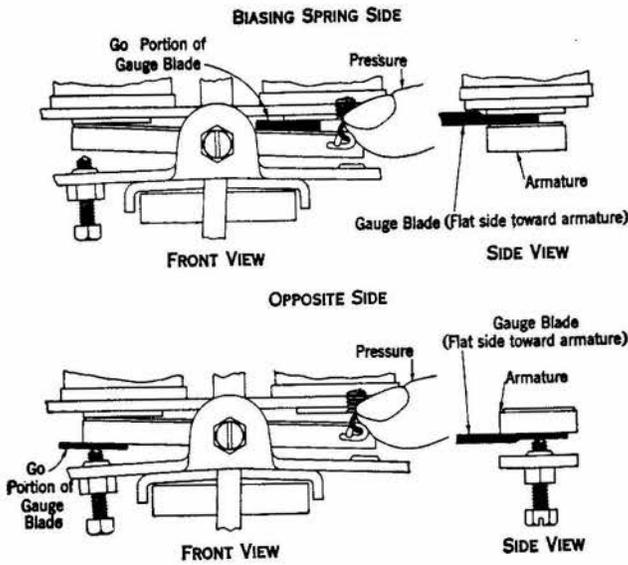


Fig. 7—Method of Checking Airgaps on 392-type Subscriber Sets (Loud Ringing Bells)

100A and B Gong Attachments

4.04 Figs. 8, 9, and 10 show procedures and methods recommended for the installation of gong attachments on numbered-type ringers. The 100B gong attachment may be used in place of the 100A gong and installed in a similar manner except for type shown in Fig. 8 where the open end shall be toward the base of the subscriber set.

5.00 Biasing Springs

5.01 The biasing springs used on the various types of ringers and loud ringing bells are shown in Table D.

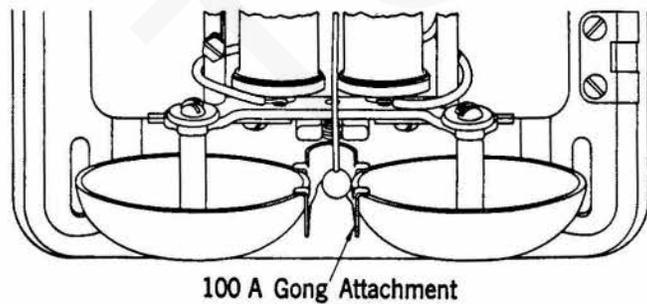


Fig. 8—100A Gong Attachment on Ringers of Types 6, 7, 8, 42, 48, and 52

5.02 The procedures in Figs. 11 and 12 are recommended when attaching biasing spring cords.

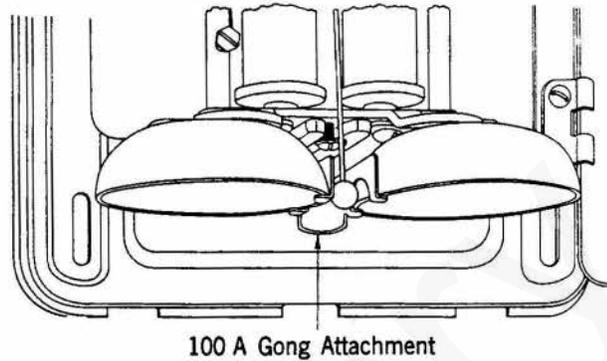


Fig. 9—100A Gong Attachment on 68- and 72-type Ringers

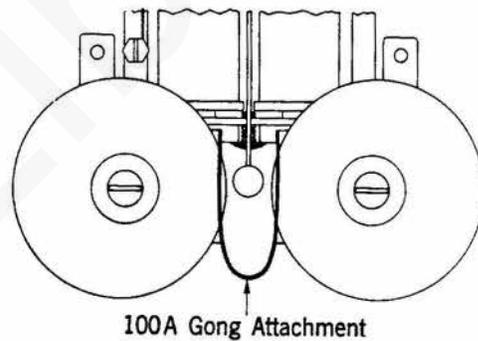


Fig. 10—100A Gong Attachment on 78-type Ringers

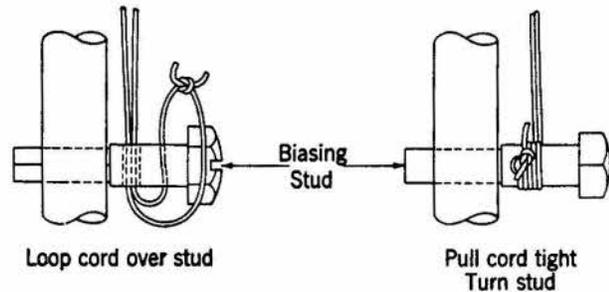


Fig. 11—Attaching Biasing Springs on Ringers

TABLE D
BIASING SPRING TYPES

Biasing Spring Assembly		Ringers	Loud Ringing Bells
Code	Cord		
P-290065	brown	All biased springs except 8B ringers for 4-party selector service	
P-157309	red		
P-290335	green		392D and K
P-157309	red		392J
P-290166	orange		392L
P-290336	white		392M

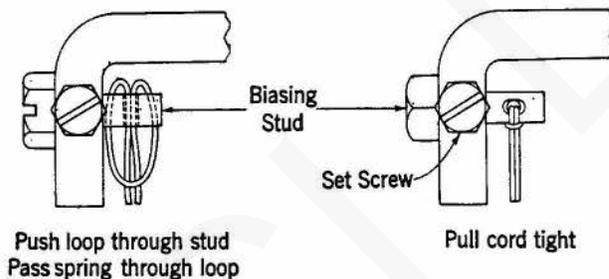


Fig. 12 — Attaching Biasing Springs on 392-type Loud Ringing Bells

Biasing Spring Tests and Adjustments

5.03 Table E specifies tests and adjustments by paragraph number.

Test for Bell Tap—Manual Ring— Capacitor-type Bridge

5.04 Operate switchhook rapidly with talking battery on the line. Bell should not ring or tap.

Test for Bell Tap—Machine Ring—Dial System— Capacitor-type Bridge

5.05 Dial any digit over 5 which is not a special code, such as long distance, operator, etc. Repeat test as many times as required. Dial tone should be heard on the line before each test.

Test for Bell Tap—Ground Identification

5.06 Some specific classes of service require a ground identification from the subscriber set (e.g. tip-party). On this type, connect hand test set across terminals L1 and L2. To test, use dial of test set.

Adjustment to Stop Bell Tap

5.07 Test polarity of ringers and line. If correct, turn biasing stud clockwise 1/16 turn at a time, until bell tap is stopped. When station or ringer cutoff key is provided, test for tapping with key in all positions. Prepay coin collector stations must be tested with coin trigger operated (circuit grounded). (See 5.12.)

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Biasing Spring Adjustment—Machine Ring—Electron Tube Bridge

5.08 On subscriber sets equipped with an electron tube, the biasing spring tension should not be more than enough to obtain good steady ringing.

Test for Cross Ring—Manual Ring—Party Line Common Battery Stations

5.09 Notify customer of opposite polarity that tests are being made. After tests are complete, notify customer again. Request operator to give a series of rings of the opposite polarity and proceed as follows:

1. With receiver on switchhook, bridge hand test set across terminals L1 and R of subscriber set.
2. During a silent interval, short-circuit terminals L2 and R with a 663 cord or other suitable test cord.
3. On next ring (as indicated by audible ringing sound in test set receiver) bell should not ring or tap.

Test for Cross Ring—Machine Ring—Manual and Dial Party Line Stations. Make only when Locally Specified.

5.10 Reverse line wire at subscriber set terminals and proceed as follows:

1. Bridge hand test set across terminals L1 and L2 of the subscriber set, and monitor the line.
2. Obtain ring at the station. During a ringing interval, short-circuit terminals L1 and L2 as indicated by the audible signal in

receiver of hand test set. If bell rings or taps, proceed as in 5.11. If bell does not ring or tap, restore original line connections.

Adjustment to Stop Cross Ring

5.11 Increase biasing spring tension by turning biasing stud not more than 1/16 turn at a time in a clockwise direction, testing for cross ringing each time, until bell is silent (see 5.12).

Final Adjustment and Margin Test

5.12 After completing tests and adjustments to prevent tapping and cross ringing of bell, obtain a ring and increase biasing spring tension 1/2 turn of biasing spring stud. Ringing should start after a silent interval and continue clearly and steadily while the extra tension is being applied. If this test is met satisfactorily, reduce tension 1/4 turn of biasing spring stud. If ringer fails to pass test, replace ringer and repeat all tests and adjustments.

6.00 DISTINCTIVE TONES

6.01 For reduced loudness, reduce the stroke (travel) of the armature by reducing the airgap on the stop screw side and readjusting the gongs. Never reduce the airgap below 0.004 inch (use 127A gauge). Blade may enter with slight looseness or slight friction.

Caution: If ringer is to be silenced, do not use the above method. Disconnect ringer and see that connections for remaining ringers are in accordance with the connection sections.

TABLE E
BELL TAP—CROSS RING TESTS AND ADJUSTMENTS

Par.	Tests and Adjustments
5.04	Test for Bell Tap — Manual Ring — Capacitor-type Bridge
5.05	Test for Bell Tap — Machine Ring — Dial System — Capacitor-type Bridge
5.06	Test for Bell Tap — Ground Identification
5.07	Adjustment to Stop Bell Tap
5.08	Biasing Spring Adjustment — Machine Ring — Electron Tube Bridge
5.09	Test for Cross Ring — Manual Ring — Party Line Common Battery Stations
5.10	Test for Cross Ring — Machine Ring — Manual and Dial Party Line Stations
5.11	Adjustment to Stop Cross Ring
5.12	Final Adjustment and Margin Test

6.02 For increased loudness, adjust ringer for maximum stroke (travel) according to air-gap requirements in 3.04 and gong adjustments in 4.01.

6.03 If there is a complaint of low ringer volume on 684-type sets, the 78-type ringers may be adjusted to have louder volume by setting the gap at 0.060 inch on the biasing spring side and 0.024 inch on the other side. After the airgaps

have been set, readjust gongs. If bell taps or cross-rings, see 5.08, 5.11, and 5.12.

6.04 Table F is a guide at installations where two or more adjacent ringers require distinctive tones.

6.05 Gong choice No. 3 is recommended for customers with impaired hearing. However, other gongs may be more effective, depending on type of impairment.

TABLE F
DISTINCTIVE GONG CHOICES

Choice	Phenol Plastic 684 Types	Metal 634, 653 Types	
	Eccentric Gongs	Eccentric Gongs	Concentric Gongs
1	Standard 1-36A 1-37A	Standard 2-29C	Standard 2-29A
2	2-37A	2-31C	2-31A
3	Cathedral 1-39A	2-33C	2-33A
4	2-36B	2-32C	2-32A
5	Choice 1, 2, or 4 with 100A or B gong at- tachment	Choice 1 or 3 with 100A or B gong at- tachment	Choice 1 or 3 with 100A or B gong at- tachment
6	2-36D		
7	Buzzer sound — spread gongs apart so that clapper does not strike them when ringing current is applied. If clapper hits with gongs farthest apart, remove gongs. This applies to all sets listed above.		