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Specifications 4588

(Replacing those parts of Specifications 3851, 3854 and Supplements thereto applying to common battery manual stations.)

COMMON BATTERY MANUAL STATIONS

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COMMON BATTERY MANUAL STATIONS

GENERAL

1. These specifications cover for the usual types of desk stand and wall set common battery manual stations, the apparatus, the methods of connecting this apparatus and the tests. For other types of common battery manual stations see separate specifications as listed under REFERENCE SPECIFICATIONS below. Separate specifications are referred to herein by name (i.e., STATION WIRING), rather than by number, as the numbers are likely to change when the specifications are revised.

The new cords included in these specifications are designated according to a new code system in which the first letter designates the type of cord (for example, "D" for desk stand), the numeral the number of conductors in the cord and the last letter, which is arbitrarily assigned in the alphabetical order in which the cords are coded and has no significance other than to designate one cord from another.

REFERENCE SPECIFICATIONS

STATIONS—HAND TELEPHONE SET
STATIONS—#50 COIN COLLECTOR INSTALLATION
#50 COIN COLLECTOR MAINTENANCE
STATION AUXILIARY SIGNALS
STATIONS—#1 RESIDENCE SYSTEM FOR MACHINE SWITCHING OPERATION
STATIONS—APPARATUS FOR DEAF SUBSCRIBERS
STATION WIRING PLANS
STATIONS—#530-A SUBSCRIBER SET FOR OUTDOOR STATIONS
STATION PROTECTION INCLUDING P.B.X'.S
STATION AND P.B.X. PROTECTOR INSTALLATION
STATION APPARATUS INSTALLATION
STATION WIRING
ADJUSTMENT OF STATION APPARATUS
#7-J AND #7-K COIN COLLECTOR MAINTENANCE

APPARATUS

2. The apparatus given below is required for the work covered by these specifications.

Apparatus Blanks:

#50-B APPARATUS BLANK for wall sets. Round metal plate with instruction card holder in center. Used to cover dial hole on #553 type wall sets when used at manual stations.

#50-D APPARATUS BLANK for #50 type desk stands. Round metal plate with instruction card holder in center. Used to cover dial hole on #50 type stands when used at manual stations. Has weight for balancing stand. **Equiv.** #50-A

#50-E APPARATUS BLANK for #51 type and #52-AB desk stands. Same as #50-D except that two terminals are provided on bottom of weight for connecting cords. May also be used (when #50-D and #50-A blanks are not available) on #50 type stands. When so employed, terminals are not used.

Apparatus Blank Repair Parts:

For #50-A, #50-B, #50-D and #50-E Apparatus Blanks:

Card Holder Frame.....P-154988
Card Holder Window.....P-137593
Card Retainer P-164442
Card Retainer Spring.....P-172045

Backboards:

#136-C BACKBOARD
Black finished wood backboard for mounting #533-Y and #553-Y Subscriber Sets at local battery stations. Has writing shelf and box for three dry cells.

#146-A BACKBOARD Metal writing shelf to be used with #148-A Backboard where #333, #533 or #553 Type Subscriber Set with writing shelf is required. **Equiv.** #143-A

#147-A BACKBOARD* Black finished wood backboard for mounting #333, #334, #533, #534, #553 and #554 Type Subscriber Sets. **Equiv.** #141-A

* Use as required by STATION APPARATUS INSTALLATION.

#148-A BACKBOARD* — **Equiv.**
Black finished wood backboard for mounting #333, #334, #533 #534 and #553 Type Subscriber Sets with #7 Type Coin Collector. Is also drilled for #333, #533 or #553 Type Subscriber Sets in combination with #146-A Backboards. — #142-A with #333 Type Sets

#148-B BACKBOARD*
Black finished wood backboard for mounting #7 Type Coin Collector with #333, #334, #533 #534 or #553 Type Subscriber Sets.

#150-A BACKBOARD*
Black finished wood backboard for mounting #7-A or #7-J Coin Collector.

#152-A BACKBOARD — **Equiv.**
Green finished wood backboard for mounting #292 and #392 Subscriber Sets to protect them from the weather. — #149-A

Battery Boxes:

#1-A BATTERY BOX
Metal box for holding three dry cells. For use at Common Battery Signaling, Local Battery Talking Stations.

#2-A BATTERY BOX*
Metal box for holding four dry cells. For use at Common Battery Signaling, Local Battery Talking Stations.

Coin Collector:

#7-J COIN COLLECTOR — **Equiv.**
Single coin collector for residence or business stations. — #7-A

Condenser:

#1021-BW CONDENSER
1 MF condenser equipped with flexible leads having cord tips and furnished with mounting strap and screws. For installing at stations in #534-DE and #534-DF Sets.

Cords:

D3A CORD — **Equiv.**
Desk stand cord for #20-AL, #40-AL, #51-AL and #52-AB Desk Stands. — #550 for #20 and #40 types

D3B CORD
Switch cord for #51-AL, #51-CM and #52-AB Desk Stands.

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* Use as required by STATION APPARATUS INSTALLATION.

D3C CORD — **Equiv.**
Black waterproof desk stand cord for #20-AL, #40-AL, #51-AL and #52-AB Desk Stands. Use only as required by Sec. 13, page 24. — #541 for #20 and #40 types

R2A CORD — **Equiv.**
Receiver cord for #144 Receiver on #20, #40 and #51 type Desk Stands and wall sets. — #549 for #20 and #40 types

R2AH CORD
Receiver cord for #528 Receiver on #52-AB Desk Stand.

R2B CORD — **Equiv.**
Black waterproof receiver cord for #144 Receiver on #20, #40 and #51 type Desk Stands and for wall sets. Use only as required by Sec. 13, page 24. — #542 for #20 and #40 types

R2H CORD — **Equiv.**
Black waterproof receiver cord for #146-A Receiver on #20, #40 and #51 type Desk Stands and #146 Receiver on wall sets. Use only as required by Sec. 13, page 24. — #542 for #20 and #40 types

R2J CORD — **Equiv.**
Receiver cord for #146-A Receiver on #20, #40 and #51 type Desk Stands and #146 Receiver on wall sets. — #549 for #20 and #40 types

T1A CORD — **Equiv.**
Transmitter cord for #20, #40, #51 and #52-AB Desk Stands and for wall sets. — #547, #548 for #20 and #40 types

#541-B CORD
Black waterproof desk stand cord for #50 type desk stands. Use only as required by Sec. 13, page 24.

#542-B CORD
Black waterproof receiver cord for #50 type desk stands. Use only as required by Sec. 13, page 24.

#547-B CORD
Transmitter cord for #50 type desk stands. Two required for each stand.

#549-B CORD
Receiver cord for #50 type desk stands.

#550-B CORD
Desk stand cord for #50 type desk stands.

#672-B CORD
Combination cord for #50-AL Desk Stands equipped with #50 type apparatus blanks. Consists of:

Two #547-B Cords
One #549-B Cord
One #550-B Cord

#6000 CORD
Combination cord for #51-AL Desk Stands equipped with #50 type apparatus blanks. Consists of:

One T1A Cord
One R2A Cord
One D3A Cord
One D3B Cord

#6007 CORD
Combination cord for #52-AB Desk Stands equipped with #50 type apparatus blanks. Consists of:

One T1A Cord
One D3B Cord
One R2AH Cord
One D3A Cord

#6009 CORD — **Equiv. #450**
Combination cord for #20 and #40 type desk stands. Consists of:

One D3A Cord
One R2A Cord
Two T1A Cords

Cord Tip:

#76 CORD TIP
Semi-hard rubber sleeve. Used with #146 and #146-A Receivers.

Desk Stands:

#40-AL DESK STAND — **Equiv. #20-SC #20-AL**
Bower-barff finished desk stand.

#40-CM DESK STAND — **Equiv. #20-CM #20-AP**
Bower-barff finished desk stand with transmitter cut-out button. Use only as required by Sec. 29, page 71.

#51-AL DESK STAND (with apparatus blank). Black finished desk stand. — **Equiv. #50-AL**

#51-CM DESK STAND (with apparatus blank). Black finished desk stand with transmitter cut-out button. Use only as required by Sec. 29, page 71. **Equiv.** #50-CM

#51-CN DESK STAND (with apparatus blank). Black finished desk stand for Common Battery Signaling Local Battery Talking Stations. See Sec. 23, page 59.

#52-AB DESK STAND (with apparatus blank). Black finished desk stand with switch-hook designed to hold #3-D head band. Use only as required by Sec. 25, page 66.

Gongs: **#29-A Gong** Regular Type. **Equiv.** #25-A

***#31-A Gong** one slot
***#32-A Gong** four slots ***#7 Wood**
***#33-A Gong** special shape

*For use where two or more ringers are near together and it is necessary to provide distinctive tones.

NOTE: The #3 Cow, #10 Tea and the #6 Sleigh Gongs may be used (on wood sets with special gong posts and clapper rods) if required by special conditions.

Headband: **#3-D HEADBAND**
Headband for use with #528 Receiver on #52-AB Desk Stand.

Instruction Cards:

FORM E-307
Circular Card used on #50-A, #50-B, #50-D and #50-E Apparatus Blanks. Has central office name only.

FORM E-515
Card for use with #128-B Number Plate. Has central office name, the first letter of which is capitalized.

FORM E-516
Card for use with #128-B Number Plate. Has central office name with "Ext." below.

FORM E-517
Blank card for use with #128-B Number Plate.

FORM E-518
Card for use with #128-D Number Plate in districts where there are competitive telephone systems. Has name of central office and words "Bell System" in white on a blue background.

FORM E-519
Card for use with #128-D Number Plate in districts where there are competitive telephone systems. Has words "Bell System" in white on a blue background.

Key:

#6017-B KEY
Two position lever type key making and breaking two sets of contacts. Used to cut in dummy ringer in place of ringer to be silenced.

Number Plates:

#128-B NUMBER PLATE
Used for holding instruction card on transmitter. Furnished with celluloid strip for covering instruction card. Instruction cards, Forms E-515 to E-517, are used with this number plate and must be ordered separately.

#128-D NUMBER PLATE
Used for holding instruction card on transmitter in districts where there are competitive telephone systems. Furnished with celluloid strip for covering instruction card. Instruction cards, Forms E-518 and E-519, are used with this number plate and must be ordered separately.

Receivers:

#144 RECEIVER
For use on desk stands and wall sets.

#146 RECEIVER
Auxiliary receiver to be used with wall sets only. See Sec. 30, page 72. Exposed cord tips connected to this receiver to be equipped with #76 Cord Tips. Receiver to be suspended by cup hook.

#146-A RECEIVER
Auxiliary receiver to be used on desk stands. See Sec. 30, page 72. Has switch for closing circuit. Exposed cord tips connected to this receiver to be equipped with #76 Cord Tips. Requires a #1-A Receiver Holder.

#528 RECEIVER
Receiver to be used on #52-AB Desk Stand. See Sec. 25, page 66. Requires a #3-D Headband.

Receiver Holder:

#1-A RECEIVER HOLDER
For holding #146-A Receiver on desk stands.

Subscriber Sets:

#392-D SUBSCRIBER SET — **Equiv. #292-Y**
Loud ringing bell (2500 ohms biased). For use at Four-Party Selective Stations.

#392-J SUBSCRIBER SET
Loud ringing bell (1000 ohms biased). For use at Individual Line, P.B.X., Two-Party Selective and Four-Party Semi-Selective Stations. Air Gap adjusted to .024" for biasing spring side and .012" for other side. Furnished with 2 MF Condenser if so ordered.

Equiv.
#392-C
#292-J
#292-W

#533-A SUBSCRIBER SET
Common battery wall set. For use on Individual Line, P.B.X., Non-Selective Party Line (code ringing), Two-Party Selective and Four-Party Semi-Selective Stations. Also at extension stations on Four-Party Selective Lines.

Equiv.
#333-B
#293-A

Wall Set with Writing Shelf
Where wall set with writing shelf is required the #533-A Subscriber Set may be used with a #146-A and a #148-A Backboard.

#333-B with #143-A Backboard.
#293-A with #132-A Backboard.
#294-A
#85-A
#85-G

#533-AR SUBSCRIBER SET
Common battery wall set with relay. For use at main stations on Four-Party Selective Lines. Also used at Two-Party Selective Stations, in accordance with supplemental instructions, in districts having pulsating ringing current and in districts having machine ringing incoming trunks not equipped with pick-up relays. See Sec. 19, page 47.

Equiv.
#296-F in districts having only 1000-3000 ohm ringers.
#296-A in districts having 2500 ohm ringers

Wall Set with Writing Shelf
Where wall set with writing shelf is required the #533-AR Subscriber Set may be used with a #146-A and #148-A Backboard.

#296-F with #132-A backboard in districts having only 1000-3000 ohm ringers.
#296-A with #132-A backboard in districts having 2500 ohm ringers
#294-AC
#294-J
#98-A in districts having 2500 ohm ringers

#533-B SUBSCRIBER SET
Common battery wall set. For use at Two-Party Selective and Four-Party Semi-Selective Stations for #7 type prepayment coin collector service.

Equiv.
#333-C
#293-J

Wall Set with Writing Shelf
Where wall set with writing shelf is required the #533-B Subscriber Set may be used with a #146-A and a #148-A backboard.

#333-C with #143-A backboard.
#293-J with backboard #294-H

#533-R SUBSCRIBER SET
Common battery wall set. Equipped with high impedance ringer to reduce severe inductive noise at Two-Party Selective and Four-Party Semi-Selective Stations. To be used only where covered by supplemental instructions.

Wall Set with Writing Shelf
Where wall set with writing shelf is required the #533-R Subscriber Set may be used with a #146-A and a #148-A backboard.

#533-Y SUBSCRIBER SET*
Common Battery Signaling. Local Battery Talking wall set. For use at all stations requiring this type set except main stations on Four-Party Selective Lines.

Equiv.
#333 with #13 Induction Coil*
#293-Y

* A #1-A Battery Box is required with these sets except where the #136-B and #136-C Backboards are used. These backboards are arranged to hold the dry cells.

Wall Set with Writing Shelf — **Equiv.** #293-Y with #136-B Backboard

Where wall set with writing shelf is required, use #533-Y Subscriber Set with a #146-A and a #148-A backboard.

#534-A SUBSCRIBER SET — **Equiv.** #334-A, #295-A, #212-A, #212-F, #101-E

Desk stand bell box for use at Individual Line, P.B.X., Non-Selective Party Line (code ringing), Two-Party Selective and Four-Party Semi-Selective Stations and at extension stations on Four-Party Selective Lines. Also used on prepayment #7 coin collector lines.

#534-AR SUBSCRIBER SET — **Equiv.** #297-G, #297-A

Desk stand bell box for use at main stations on Four-Party Selective Lines. Has 1000-3000 ohm ringer and relay.

Also used at Two-Party Selective Stations, in accordance with supplemental instructions, in districts having pulsating ringing current and in districts having machine ringing incoming trunks without pick-up relays. See Sec. 19, page 47.

#534-C SUBSCRIBER SET — **Equiv.** #334-R, #295-AC, #131-K

Desk stand bell box without ringer. For use at extension stations at Individual Line, P.B.X., Two-Party Selective, Four-Party Semi-Selective, Four-Party Selective Stations and Non-Selective Party Line Stations.

#534-DE SUBSCRIBER SET — **Equiv.** #43-AF*

Extension ringer. For use at stations having #533-R or #534-R Subscriber Sets. Furnished with #1021-BW Condenser if so ordered.

* Not arranged to mount condenser.

#534-DF SUBSCRIBER SET — **Equiv.**

Extension ringer. For use at all stations except those having #533-R or 534-R Subscriber Sets. Furnished with #1021-BW condenser if so ordered.

Equiv.
#534-D**
#334-P**
#295-L**
#127-A**
#43-F*

#534-P SUBSCRIBER SET

Desk stand bell box. Has split condenser (1 MF-1 MF in one can). For use at Two-Party Selective and Four-Party Semi-Selective Stations for prepayment #7 coin collector service.

#534-R SUBSCRIBER SET

Desk stand bell box. Equipped with high impedance ringer to reduce severe inductive noise at Two-Party Selective and Four-Party Semi-Selective Stations. To be used only where authorized by supplemental instructions.

#534-Y SUBSCRIBER SET* ** — **Equiv.**

Common Battery Signaling, Local Battery Talking desk stand bell box. For use at all stations requiring this type set except main stations on Four-Party Selective Lines.

Equiv.
#295-AA

#553-A SUBSCRIBER SET (with apparatus blank). Wall set for use at:

Individual Line Stations.
P.B.X. Stations.
Two-Party Selective Stations.
Four-Party Semi-Selective Stations.
Also at extension stations on Four-Party Selective Lines.

Wall Set with Writing Shelf

Where wall set with writing shelf is required the #553-A Subscriber Set may be used with a #146-A and a #148-A Backboard.

#553-AR SUBSCRIBER SET (with apparatus blank). Wall set for use at main stations on Four-Party Selective Lines. Also where there are severe ground potential conditions on these stations. See Sec. 22, page 59. Equipped with relay and has split condenser (1 MF-1/2 MF) in one can.

* Not arranged to mount condenser.
** Has condenser.

*** A #1-A Battery Box is required with sets except where the #136-B and #136-C Backboards are used. These backboards are arranged to hold the dry cells.

Wall Set with Writing Shelf
Where wall set with writing shelf is required the #553-AR Subscriber Set may be used with a #146-A and a #148-A Backboard.

#553-B SUBSCRIBER SET (with apparatus blank). Wall set for use with #7 type coin collector at Two-Party Selective and Four-Party Semi-Selective stations. Has back contact on switch hook.

#553-R SUBSCRIBER SET (with apparatus blank). Wall set equipped with high impedance ringer to reduce severe inductive noise at Two-Party Selective and Four-Party Semi-Selective stations. To be used only when covered by supplemental instructions.

#553-Y SUBSCRIBER SET (with apparatus blank).* Wall set for use at Common Battery Signaling, Local Battery Talking Stations except main stations on Four-Party Selective Lines.

#554-AR SUBSCRIBER SET
Desk stand bell box with 1000-3000 ohm ringer and relay. Has split condenser (1 MF-1/2 MF) in one can. For use at main stations on Four-Party Selective Lines where there are severe ground potential conditions. See Sec. 22, page 59.

Switch: **#2047 SWITCH**
Indicating snap switch for silencing a ringer wired in parallel with another ringer.

Transmitters: **#323 TRANSMITTER**
#329 TRANSMITTER
#337 TRANSMITTER
Used on desk stands and wall sets as required by the **approved transmission zoning practice.**

*A #1-A Battery Box is required with these sets except where the #136-B and #136-C Backboards are used. These backboards are arranged to hold the dry cells.

3. Apparatus arranged according to stations:

For convenience in selecting subscriber sets and desk stands for manual stations, they are grouped below according to class of station. Only standard apparatus regularly used at these stations is included. For equivalents see APPARATUS, Sec. 2, pages 8 to 18.

Individual Line Stations
Non-Selective Party Stations (Code Ringing)
P.B.X. Stations
Two-Party Selective Stations.
Four-Party Semi-Selective Stations.

Main Set		Extension Set		Desk Stand
Desk	Wall	Desk	Wall	
#534-A	#533-A or #553-A	#534-A or #534-C	#533-A or #553-A	#40-AL #50-AL or #51-AL

Four-Party Selective Stations

Main Set		Extension Set		Desk Set
Desk	Wall	Desk	Wall	
#534-AR or #554-AR	#533-AR or #553-AR	#534-A or #534-C	#533-A or #553-A	#40-AL #50-AL or #51-AL

Common Battery Signaling Local Battery Talking Stations*

Main Set		Extension Set	Desk Set
Desk	Wall		
#534-Y	#533-Y or #553-Y	See Section 11 (d)	#40-AL #50-AL or #51-CN

* Battery boxes and dry cells are required for these stations.

CONNECTIONS

4. General. Connect subscriber sets and associated apparatus according to these specifications. Where wiring plans are involved, follow STATION WIRING PLANS.

5. Tip and Ring. The "tip" and "ring" sides of manual common battery lines are as given below:

"Tip" (ground) side of line is connected to ground side of central office battery.

"Ring" (battery) side of line is connected to live side of central office battery.

Exceptions to the above are:

(a) Prepayment coin collector lines have "tip" connected to live side of central office battery and "ring" open until operator plugs cord in jack, which connects "tip" to ground side and "ring" to live side of central office battery.

(b) #8 switchboards have "tip" connected to live side and "ring" connected to ground side of central office battery.

Test for "tip" and "ring" by connecting one terminal of receiver or hand test set to ground and other terminal alternately to each side of line. "Ring" side gives louder click in receiver.

(a) With prepayment coin collector lines, have operator plug cord in jack before making test.

(b) With #8 switchboards, in testing with receiver or test set, "tip" side gives louder click in receiver.

At individual or non-selective party line stations if ground is not convenient, test for "Tip" and "Ring" as follows: See that ringer is poled properly. (Sec. 9, page 23.) Remove tension on biasing spring. Connect one side of line to L1 and the other side to C (See Figure 3, page 28). If armature is pulled toward biasing spring side, "Ring" side of the line is connected to L1. If armature is pulled away from biasing spring side, the "Tip" side of the line is connected to L1. (The foregoing applies in areas having positive side of central office battery grounded. In areas having the negative side grounded, armature pull is reversed with same line connection.)

6. Color Scheme.

Connect tracers of inside wire as follows:

Red tracer to "ring" side of line.
Green tracer to "tip" side of line.
Use yellow tracer for signaling ground wire or other purpose where a third wire is required.

Where pair bridle wire is used:

Tracer wire corresponds to red tracer inside wire and should be connected to "ring."
Plain wire corresponds to green tracer inside wire and should be connected to "tip."

Where triple bridle wire is used:

The single tracer and plain wires should be connected as for pair bridle wire.
The double tracer wire corresponds to yellow tracer inside wire.

In connecting wires and cords, connect like tracers (red to red, yellow to yellow, etc.).

7. Number of Ringers Allowed—All Stations.

In machine ringing districts, the number of ringers must be limited to prevent premature operation of tripping relay at Central Office. Because of possibility of adoption of machine ringing in other districts, use standard ringer wiring for all new work and when changes in wiring are made at existing installations.

Do not install for any subscriber (on one line) more than the following number of ringers (including main station ringer):

Individual Line Stations	4 (Figures 5, 9 and 10)
P.B.X. Stations*	4 (Figures 13, 17 and 18)
Non-Selective Party Line Stations	2 (Figures 5 and 9)
Two-Party Selective Stations	4 (Figures 24 and 27)
Four-Party Semi-Selective Stations	2 (Figures 29 and 30)
Four-Party Selective Stations	2 (Figures 36, 37 and 38)

Where 4 ringers are allowed, there must be not more than 2 ringer bridges, and where only 2 ringers are allowed, not more than 1 ringer bridge.

* In case of 600-C P.B.X. Stations which may be put up on night connections with regular cords or at 505-C P.B.X. stations on night connections only 1 ringer bridge consisting of a 1 MF condenser with not more than two ringers (Figures 15 or 16) is allowable.

8. Condenser Capacity Allowed—All Stations.

Subscriber sets may be equipped with 1 MF, 1.75 MF (repaired 2 MF) or 2 MF condensers in series with the ringers. These sets, so far as the condensers are concerned, may, in general, be used interchangeably. Under certain conditions, however, sets with 1 MF condensers are necessary in order to limit the capacity across the line or from either side of the line to ground to an amount which will insure satisfactory operation and the Figures herein, with accompanying explanations, specify where these 1 MF condensers are required.

1 MF condensers are in small cans marked 1 MF or in large cans with a red stripe on the terminal end also marked 1 MF. Where a 1 MF condenser is specified in the Figures, do not use a condenser marked 1 MF and having a yellow stripe on the terminal end, as this marking indicates a capacity exceeding 1 MF.

The conditions requiring 1 MF condensers are as follows and capacity limits as shown should be followed for all new work and when changes are made at existing installations:

Individual Line Stations:

With two ringer bridges, either or both of which have two ringers, use 1 MF condenser in each bridge (to insure satisfactory ringing).

P.B.X. Stations:

With two ringer bridges use 1 MF condenser in each bridge (to avoid premature tripping of machine ringing on night connections put up with regular cords).

NOTE: In case of 600-C P.B.X. stations which may be put up on night connections with regular cords, or at 505-C P.B.X. stations on night connections, only one ringer bridge is permissible (because of bridged capacity in the circuits at the P.B.X.) and the condenser in this bridge must be 1 MF.

Two-Party Selective Stations:

With two ringers in series where there is a parallel bridge with a single ringer, use 1 MF condenser in bridge having two ringers in series (to insure satisfactory ringing).*

* NOTE: High impedance ringers requiring 1MF condensers are covered on pages 43, 45, 47, 49 and 50.

Four-Party Semi-Selective Stations:

With two ringers in series, use 1 MF condenser (to insure satisfactory ringing).*

Condenser capacities for loud ringing bells at all stations may be the same as for normal ringing bells. However, to obtain maximum volume of sound, it is desirable to use 2 MF condensers with loud ringing bells not having another ringer in series, provided this does not conflict with the condenser capacity requirements.

9. Connecting Ringer Leads—All Stations.

Connect red and black ringer leads as shown in Figures 1 to 48, pages 26 to 70, in order to insure correct poling of ringers. This practice is uniform with that for dial stations and will make unnecessary any changes in ringer connections in case these stations are cut over to dial operation. Also, poling is necessary at two-party selective and four-party semi-selective stations to prevent a bell tap each time the switchhook is operated, which otherwise would be caused by the opening and closing of a direct current path from the central office battery through the ringer to ground.

In some old style sets the ringer leads are not red and black. In these cases the ringer coil lead nearest the biasing spring corresponds to the black lead. The #534-DE and #534-DF extension ringer sets have terminals marked R and B (corresponding to the red and black leads) and a third terminal (for use where a condenser is required) which is marked "L2."

10. Use of Side-Tone Reduction Circuit—All Stations.

The volume of side-tone with #323 Transmitters when used on short loops sometimes is objectionable. At all stations in the side-tone reduction zone at which #323 Transmitters are installed, use side-tone reduction circuit. Connect sets for side-tone reduction according to class of line shown in Figures 1 to 48, pages 26 to 70. There is no side-tone reduction zone in areas served by #8 and #9-D switchboards.

Orders for new installations will be marked, in accordance with supplemental instructions, to indicate whether they are in the side-tone reduction zone.

* NOTE: High impedance ringers requiring 1MF condensers are covered on pages 43, 45, 47, 49 and 50.

At stations not in the side-tone reduction zone, connections for side-tone reduction should seldom be necessary. However, should there be cases where the subscriber complains of side-tone under these conditions,

(a) Suggest that subscriber eliminate the side-tone by holding palm of hand over mouthpiece while listening.
(b) If (a) is not satisfactory to subscriber, refer complaint to your Supervisor.

11. Selection of Sets and Desk Stands for Extension Stations.

Where **ringer is required** at extension stations, use set with induction coil, condenser and ringer (#534-A or equivalent for individual lines, etc.).

Where a **ringer is not required,** make sure that a **desk stand only** is used except under the following unusual conditions, where a set with induction coil and condenser but no ringer (#534-C or equivalent for individual lines, etc.) should be used:

(a) Where main station has wood type wall set.
(b) Where wire run between main and extension stations is over 250 feet.
(c) Where main and extension stations are in different buildings (in accordance with service order).
(d) At common battery signaling and local battery talking stations where wire run between main and extension stations is over 25 feet (use set with induction coil, condenser and ringer, disconnecting ringer).

Where wall set without ringer is required at extension station, use wall set, disconnecting ringer.

12. Receivers and Transmitters.

All new stations should be equipped with #144 Receivers and #323, #329, or #337 Transmitters as required by the **approved transmission zoning practice.** For use of head and auxiliary receivers see Sections 25 and 30, pages 66 and 72.

13. Use of Waterproof Cords.

Install waterproof desk stand and receiver cords at stations permanently located outdoors or where exposed to corrosive fumes or in damp locations (such as may be found in subways, markets, cellars, basements, laundries, stables, chemical works, etc.).

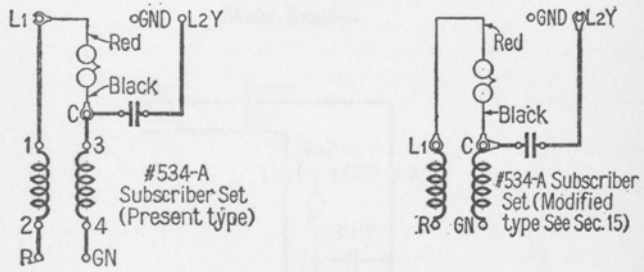
14. Handling Apparatus. Handle all apparatus with care to avoid injury to transmitters, cords, receivers, etc. Improper handling may lead to impaired service and expense to the company for repairs.

15. Modified Types of Subscriber Sets. Modified types of #533, #534 and #553 sets with simplified wiring are shown on the circuit drawings. These modified sets differ from the present sets in that they have the terminals L1, R, GN and C mounted on the induction coil. This arrangement eliminates the wires which now run from the induction coil to the terminal strip.

16. Individual Line Stations:

Figure 1

Desk Stand Connections



Connect Red of Desk Stand Cord to R in Subscriber Set
Connect Green of Desk Stand Cord to GN in Subscriber Set
Connect Yellow of Desk Stand Cord to L2Y in Subscriber Set

For Side Tone Reduction:

Connect Red of Desk Stand Cord to L2Y in Subscriber Set
Connect Yellow of Desk Stand Cord to R in Subscriber Set

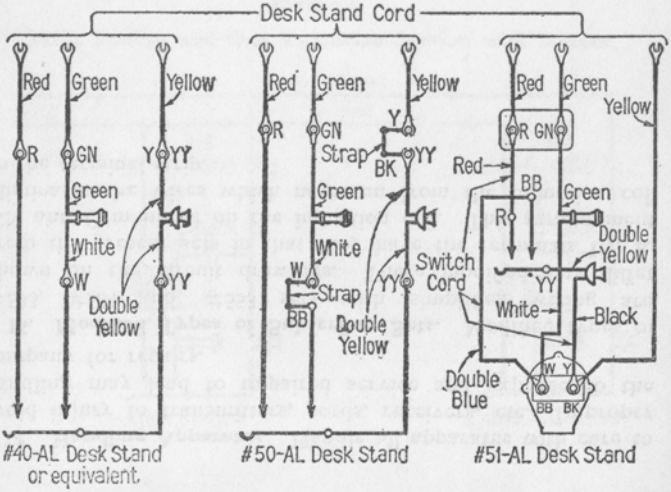
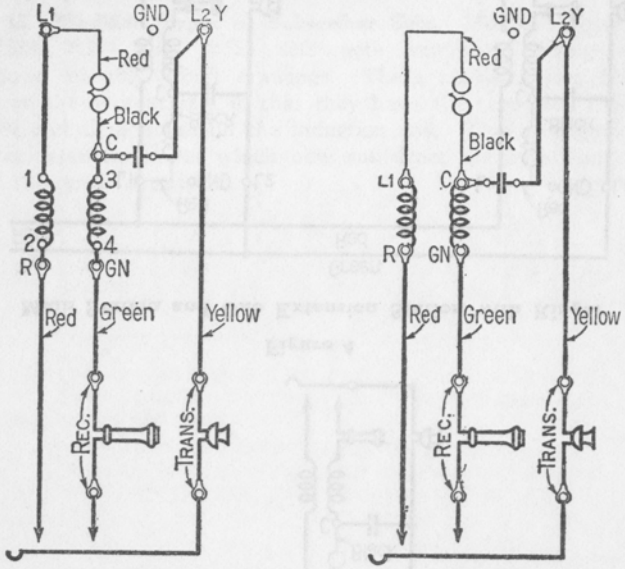


Figure 2

Wall Set Connections



For Side Tone Reduction Connect Yellow to R and Red to Y

Connections for #553-A Set with apparatus blank are as above with white and double blue dial leads in set connected to REC. terminal to which white dial lead is soldered; yellow and black dial leads connected to TRANS. terminal to which black dial lead is soldered.

Individual Line Stations:

Line and Ringer Connections

Figure 3

Main Station

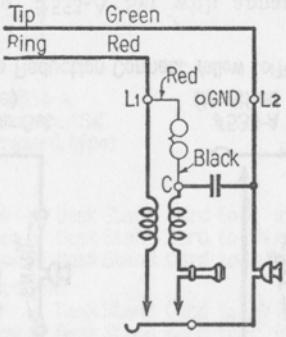


Figure 4

Main Station and One Extension Station with Ringer

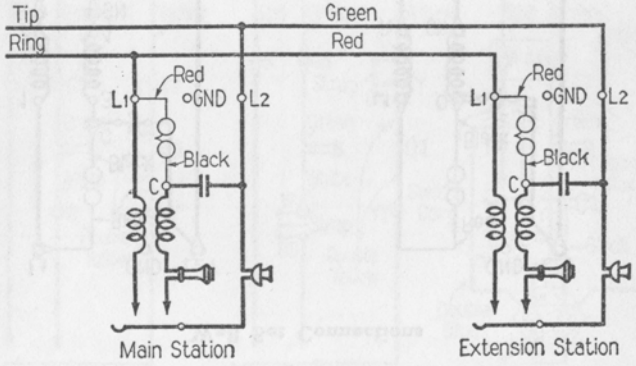


Figure 5

Main Station and Two or Three Extension Stations with Ringers

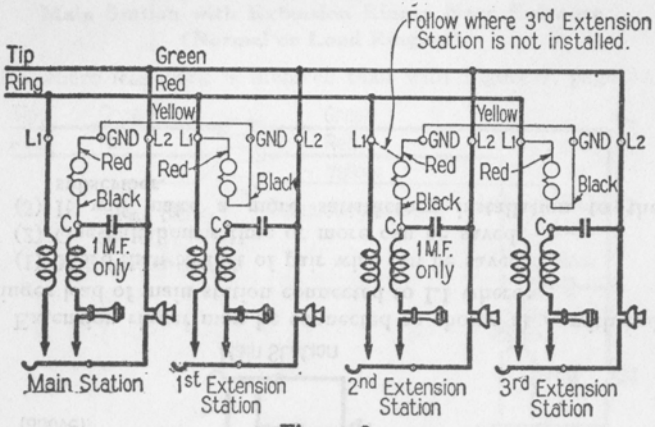
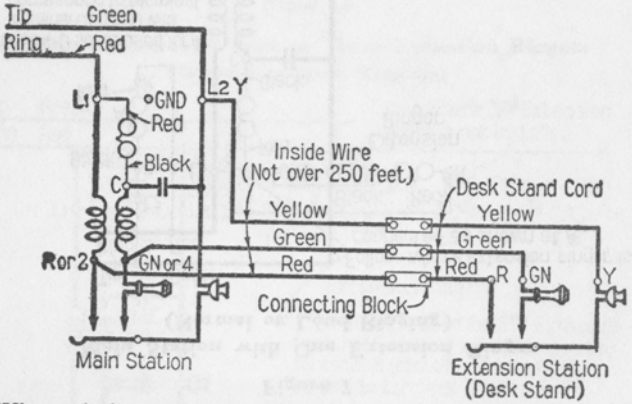


Figure 6

Main Station and Extension Station without Ringer

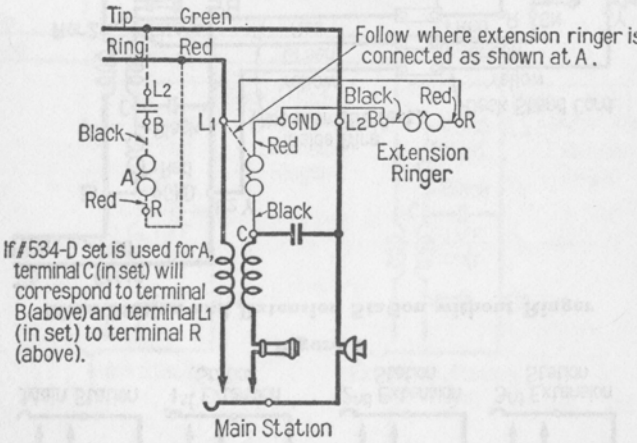


Where desk stand with #534-C Set (or equivalent) or wall set (#533-A or #553-A Set with ringer disconnected) is used at extension station, bridge set on line same as main station set. See Section 11, page 24.

Individual Line Stations:

Figure 7

Main Station with One Extension Ringer (Normal or Loud Ringing)



Extension ringer may be connected as shown at A with red ringer lead of main station connected to L1 where:

(1) More than 50 feet of pair wire can be saved.

(2) One-half hour's time or more can be saved.

(3) It will make a more satisfactory installation to the subscriber.

Figure 8

Main Station with Extension Ringer Near Entrance (Normal or Loud Ringing)

Use where less work is involved than with Figure 7, page 30.

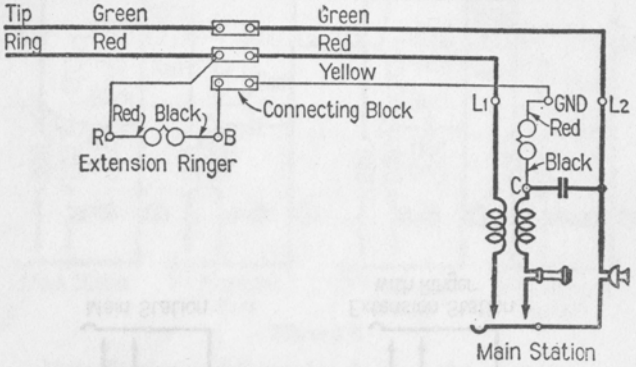
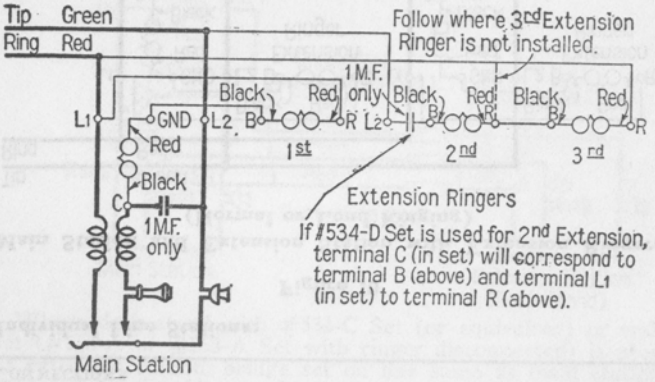


Figure 9

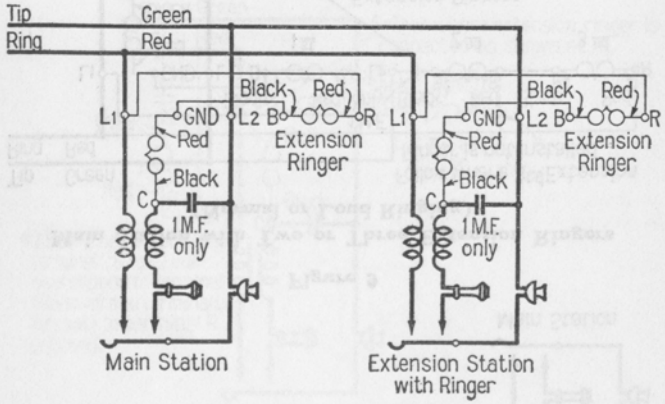
Main Station with Two or Three Extension Ringers (Normal or Loud Ringing)



Individual Line Stations:

Figure 10

Main Station and Extension Station with Extension Ringers (Normal or Loud Ringing)



17. Private Branch Exchange Stations.

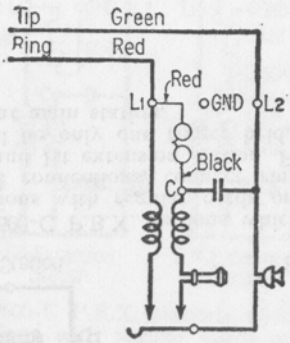
Desk Stand and Wall Set Connections.

The desk stand and wall set connections are the same as for Individual Line Stations, Figures 1 and 2, pages 26 and 27.

Line and Ringer Connections.

Figure 11

Main Station

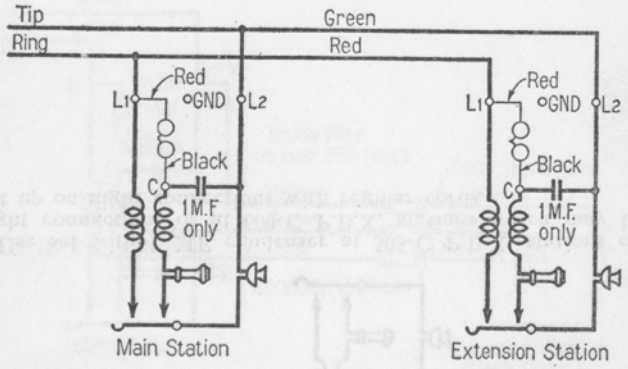


Use set with 1 MF condenser at 505-C P.B.X. stations on night connections or at 600-C P.B.X. stations which may be put up on night connections with regular cords.

P.B.X. Stations:

Figure 12

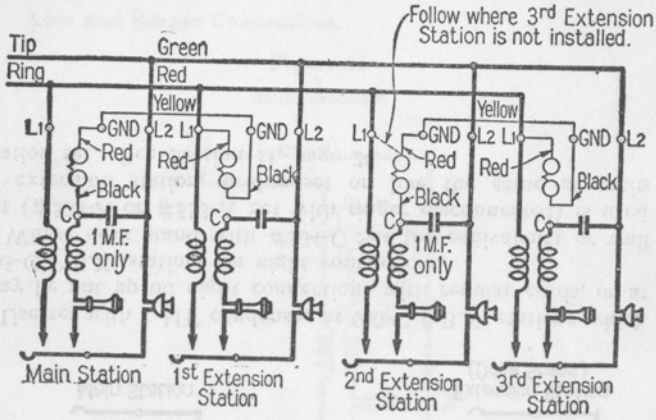
Main Station and One Extension Station with Ringer



If required at 600-C P.B.X. stations which may be put up on night connections with regular cords or at 505-C P.B.X. stations on night connections, connect ringers in series as shown for main and 1st extension station, Figure 13, page 35, so that there will be only one ringer bridge. Use set with 1 MF condenser at main station.

Figure 13

Main Station and Two or Three Extension Stations with Ringers

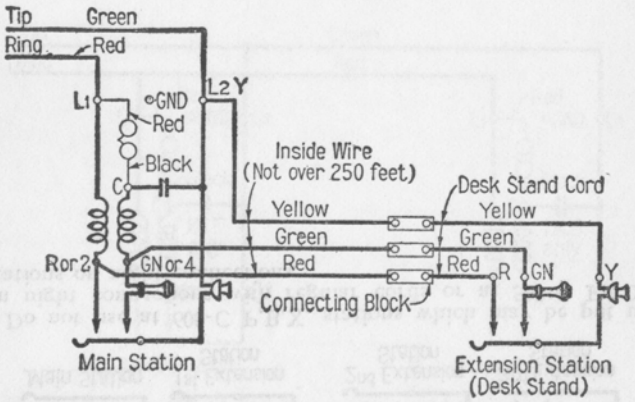


Do not use at 600-C P.B.X. stations which may be put up on night connections with regular cords or at 505-C P.B.X. stations on night connections.

P.B.X. Stations:

Figure 14

Main Station and Extension Station without Ringer

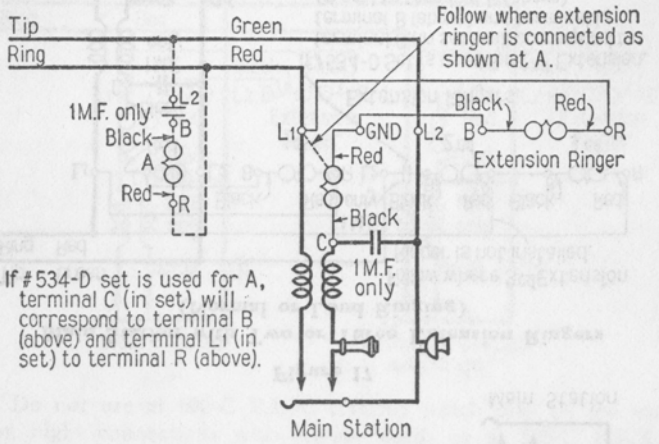


Use set with 1 MF condenser at 600-C P.B.X. stations which may be put up on night connections with regular cords, or at 505-C P.B.X. stations on night connections.

Where desk stand with #534-C Set (or equivalent) or wall set (#533-A or #553-A Set with ringer disconnected) is used at extension station, bridge set on line the same as main station set. See Section 11, page 24.

Figure 15

Main Station with One Extension Ringer (Normal or Loud Ringing)



Do not use extension ringer "A" at 600-C P.B.X. stations which may be put up on night connections with regular cords, or at 505-C P.B.X. stations on night connections, because of the two ringer bridges.

The extension ringer may be connected as shown at "A" with red ringer lead of main station connected to "L1," where:

(1) More than 50 feet of pair wire can be saved.
(2) One-half hour's time or more can be saved.
(3) It will make a more satisfactory installation to the subscriber.

P.B.X. Stations:

Figure 16

Main Station with Extension Ringer Near Entrance (Normal or Loud Ringing)

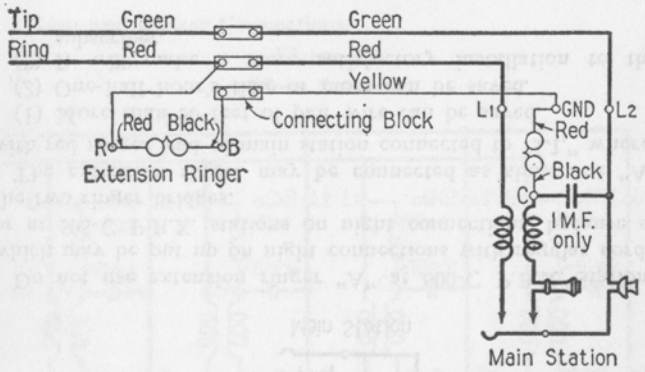
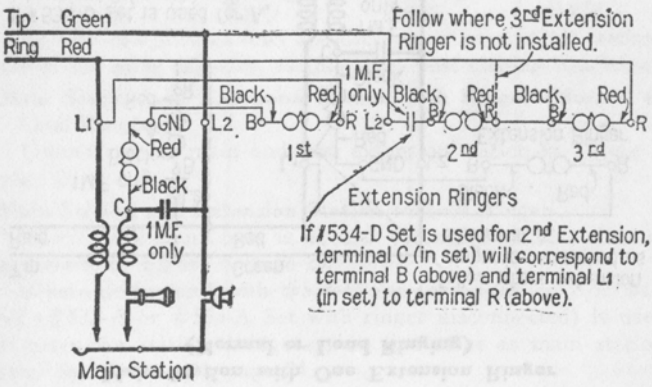


Figure 17

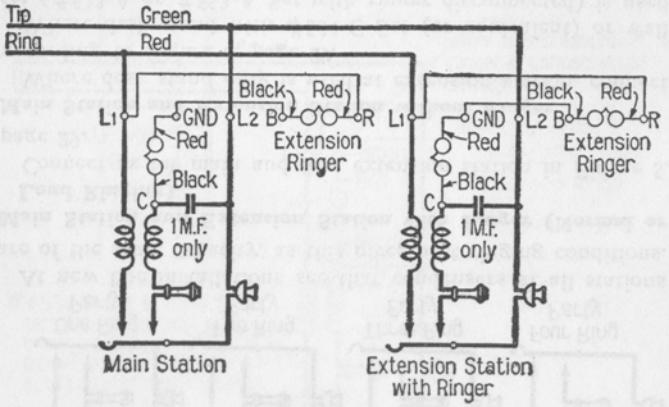
Main Station with Two or Three Extension Ringers (Normal or Loud Ringing)



Do not use at 600-C P.B.X. stations which may be put up on night connections with regular cords or at 505-C P.B.X. stations on night connections.

Figure 18

Main Station and Extension Station with Extension Ringers (Normal or Loud Ringing)



Do not use at 600-C P.B.X. stations which may be put up on night connections with regular cords or at 505-C P.B.X. stations on night connections.

18. Non-Selective Party Line (Code Ringing) Stations.

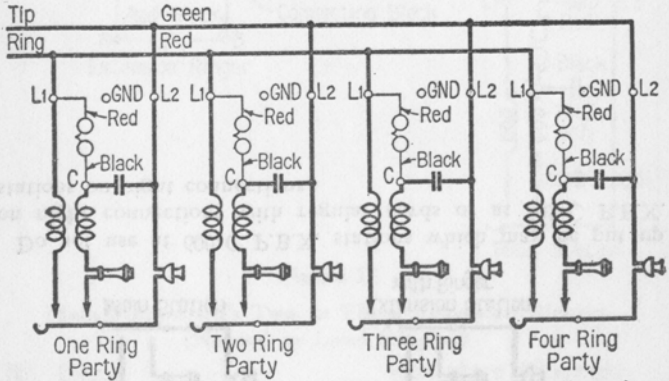
Desk Stand and Wall Set Connections:

The desk stand and wall set connections are the same as for Individual Line Stations, Figures 1 and 2, pages 26 and 27.

Line and Ringer Connections

Figure 19

Main Stations



At new line installations see that condensers at all stations are of the same capacity, as this gives best ringing conditions.

Main Station and Extension Station with Ringer (Normal or Loud Ringing)

Connect as for main and first extension station in Figure 5, page 29.

Main Station and Extension Station without Ringer

Where desk stand only is used at extension station, connect according to Figure 6, page 29.

Where desk stand with #534-C Set (or equivalent) or wall set (#533-A or #553-A Set with ringer disconnected) is used at extension station, bridge set on line same as main station set. See Section 11, page 24.

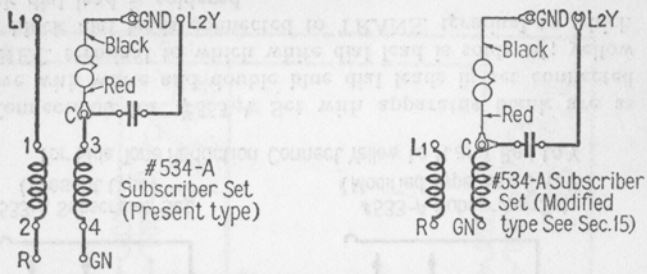
Main Station and Extension Ringer (Normal or Loud Ringing)

Connect as for main station and first extension ringer in Figure 9, page 31.

19. Two-Party Selective Stations.

Figure 20

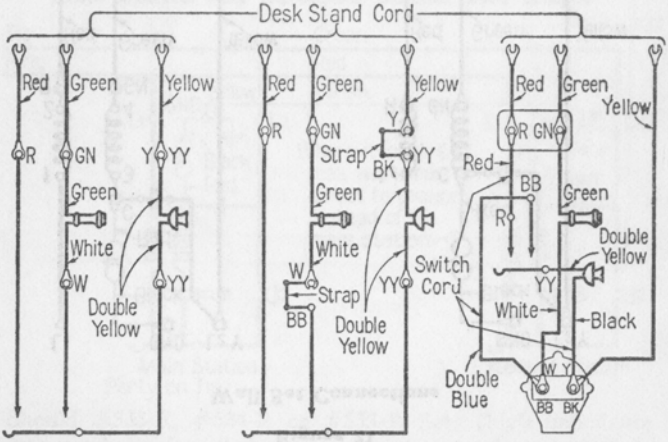
Desk Stand Connections



Connect Red of Desk Stand Cord to R in Subscriber Set
Connect Green of Desk Stand Cord to GN in Subscriber Set
Connect Yellow of Desk Stand Cord to L2Y in Subscriber Set

For Side Tone Reduction:

Connect Red of Desk Stand Cord to L2Y in Subscriber Set
Connect Yellow of Desk Stand Cord to R in Subscriber Set

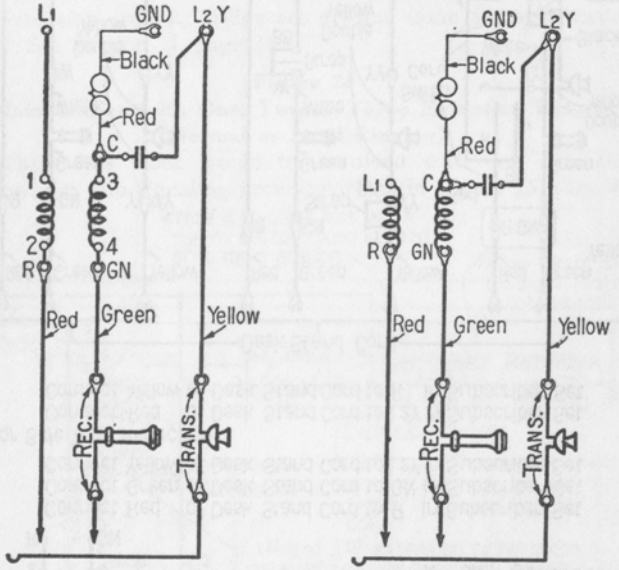


Should #534-R Set (high impedance ringer set) be installed, in accordance with supplemental instructions, connect as above.

Two-Party Selective Stations:

Figure 21

Wall Set Connections



#533-A Subscriber Set (Present type)

#533-A Subscriber Set (Modified type See Sec. 15)

For Side Tone Reduction Connect Yellow to R. and Red to Y

Connections for #553-A Set with apparatus blank are as above with white and double blue dial leads in set connected to REC. terminal to which white dial lead is soldered; yellow and black dial leads connected to TRANS. terminal to which black dial lead is soldered.

Should #533-R or #553-R Set (high impedance ringer set) be installed, in accordance with supplemental instructions, connect as above.

Line and Ringer Connections

Figure 22

Main Stations

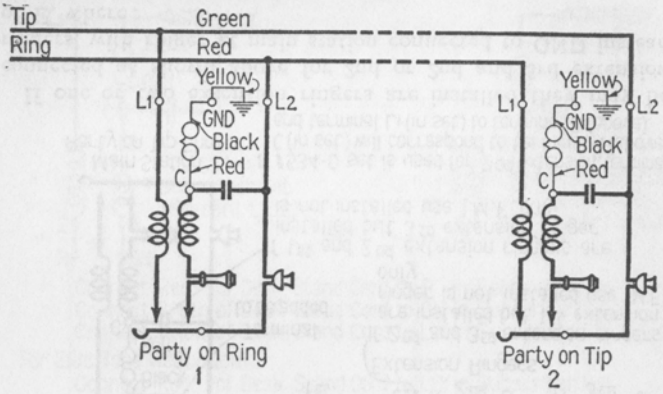
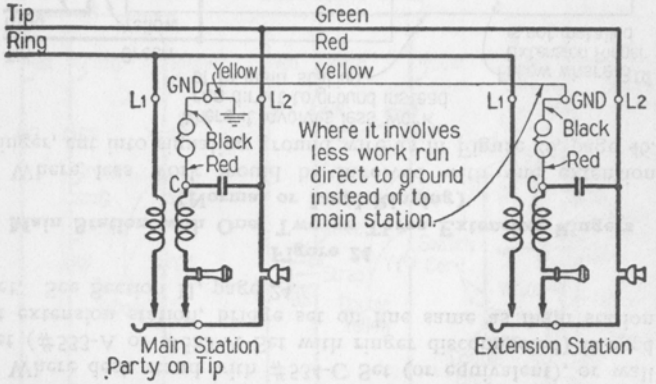


Figure 23

Main Station and Extension Station with Ringer



Should #533-R, #534-R or #553-R Sets (high impedance ringer sets) be installed at main and extension station, in accordance with supplemental instructions, connect main and extension station ringers as shown for main stations, Figure 22. If high impedance ringers are substituted in sets at station make sure that condensers are 1 MF.

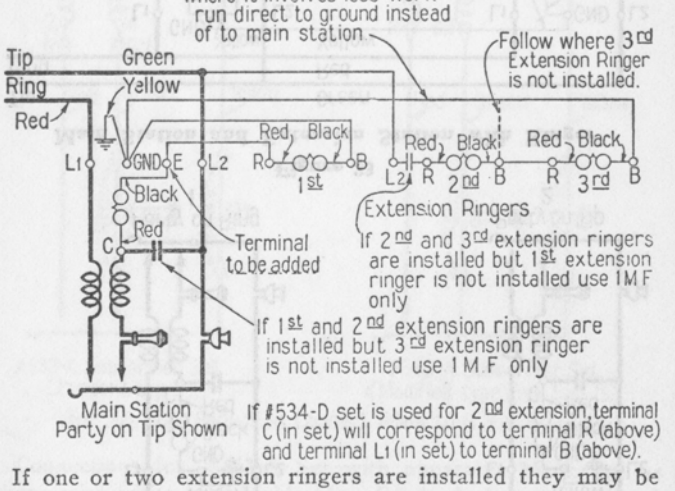
Two-Party Selective Stations:
Main Station and Extension Station without Ringer

Where desk stand only is used at extension station wire to terminals of main station set as in Figure 6, page 29.

Where desk stand with #534-C Set (or equivalent), or wall set (#533-A or #553-A Set with ringer disconnected) is used at extension station, bridge set on line same as main station set. See Section 11, page 24.

Figure 24
Main Station with One, Two or Three Extension Ringers (Normal or Loud Ringing)

Where less work would be involved with one extension ringer, cut into signaling ground wire as in Figure 26, page 46.

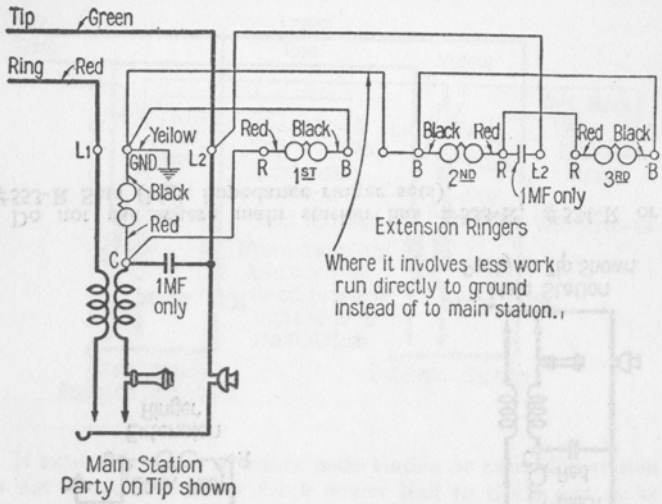


If one or two extension ringers are installed they may be connected as shown above for 2nd or 2nd and 3rd extension ringers, with ringer at main station connected to GND instead of E, where:

(1) More than 50 feet of pair wire can be saved
(2) One-half hour's time or more may be saved.
(3) It will make a more satisfactory installation to the subscriber.

Figure 25

Main Station with One, Two or Three Extension Ringers (High Impedance Ringers)



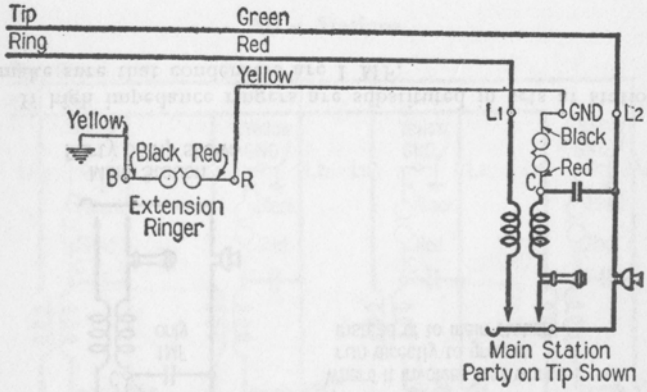
If high impedance ringers are substituted in sets at station, make sure that condensers are 1 MF.

Two-Party Selective Stations:

Figure 26

Main Station with Extension Ringer (Normal or Loud Ringing) Cut into Signaling Ground Wire

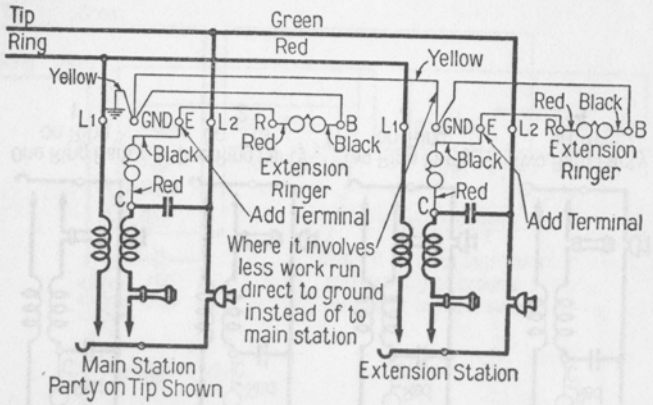
Use where less work is involved than installing first extension ringer of Figure 24, page 44.



Do not use where main station has #533-R, #534-R or #553-R Sets (high impedance ringer sets).

Figure 27

Main Station and Extension Station with Extension Ringers (Normal or Loud Ringing)



If extension ringer at either main station or extension station is not installed, connect black ringer lead to GND and make sure that 1 MF condenser is used in set having extension ringer.

Should #533-R, #534-R or #553-R Sets (high impedance ringer sets) be installed, in accordance with supplemental instructions, at main and extension stations, connect main and extension station ringers to GND and extension ringers (#534-DE Sets or equivalent) in parallel with main and extension set ringers. If high impedance ringers are substituted in sets at station, make sure that condensers are 1 MF.

Stations with Relay Sets.

Where relay sets (#533-AR, #534-AR, #553-AR or #554-AR Sets) are used at two-party selective stations, in accordance with supplemental instructions, connect as for same party on four-party selective lines.

20. Four-Party Semi-Selective Stations.

Desk Stand and Wall Set Connections:

The desk stand and wall set connections are the same as for Two-Party Selective Stations, Figures 20 and 21, pages 41 and 42.

Line and Ringer Connections:

Figure 28

Main Stations

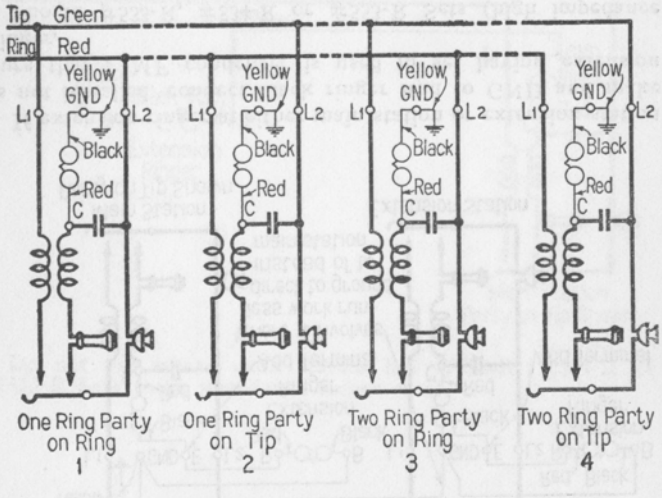
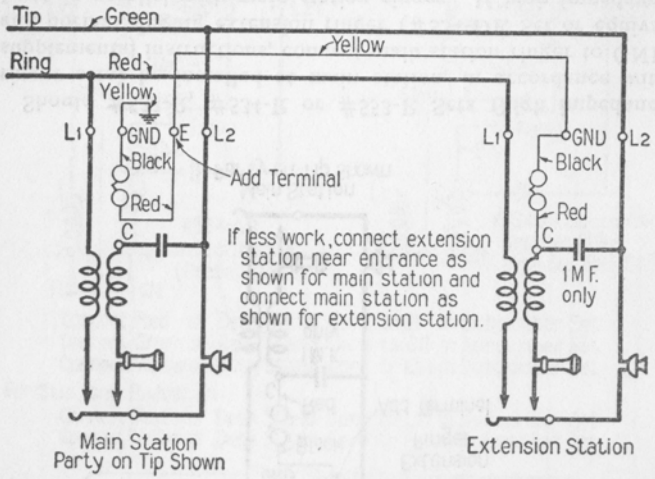


Figure 29

Main Station and Extension Station with Ringer



Should #533-R, #534-R or #553-R Sets (high impedance ringer sets) be installed at main and extension station, in accordance with supplemental instructions, connect main and extension station ringers as shown for main stations, Figure 28, page 48. If high impedance ringers are substituted in sets at stations, make sure that condensers are 1 MF.

Main Station and Extension Station without Ringer

Where desk stand only is used at extension station, connect to main station set as in Figure 6, page 29.

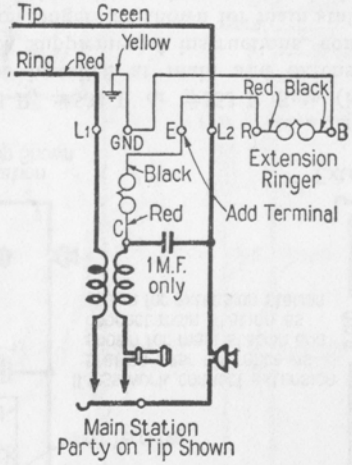
Where desk stand with #534-C (or equivalent) or wall set (#533-A or #553-A Set with ringer disconnected) is used at extension station, bridge set on line same as main station set. See Section 11, page 24.

Four-Party Semi-Selective Stations:

Figure 30

Main Station with Extension Ringer (Normal or Loud Ringing)

Where less work would be involved, cut extension ringer into signaling ground wire, Figure 26, page 46.

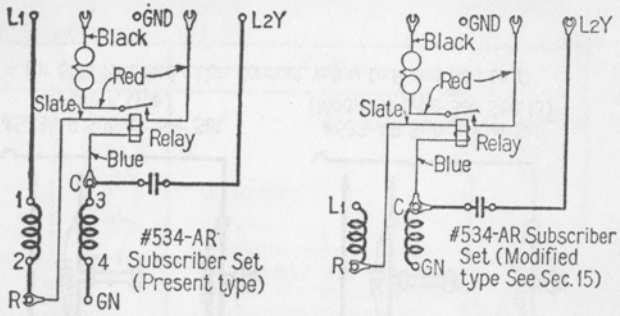


Should #533-R, #534-R or #553-R Sets (high impedance ringer sets) be installed at main station, in accordance with supplemental instructions, connect main station ringer to GND and normal ringing extension ringer (#534-DE Set or equivalent) in parallel with main station ringer. If high impedance ringers are substituted in sets at station, make sure that condensers are 1 MF.

21. Four-Party Selective Stations.

Four-Party Selective Sets equipped with 2500 ohm ringers shall be used only in areas where authorized by supplemental instructions.

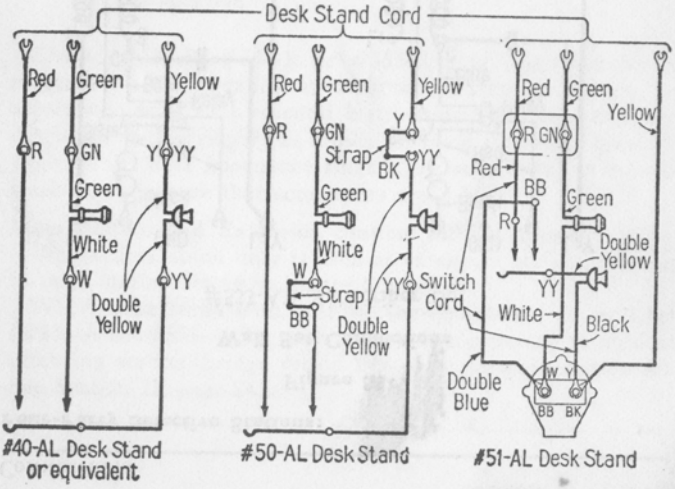
Figure 31
Desk Stand Connections



Connect Red of Desk Stand Cord to R in Subscriber Set
Connect Green of Desk Stand Cord to GN in Subscriber Set
Connect Yellow of Desk Stand Cord to L2Y in Subscriber Set

For Side Tone Reduction:

Connect Red of Desk Stand Cord to L2Y in Subscriber Set
Connect Yellow of Desk Stand Cord to R in Subscriber Set

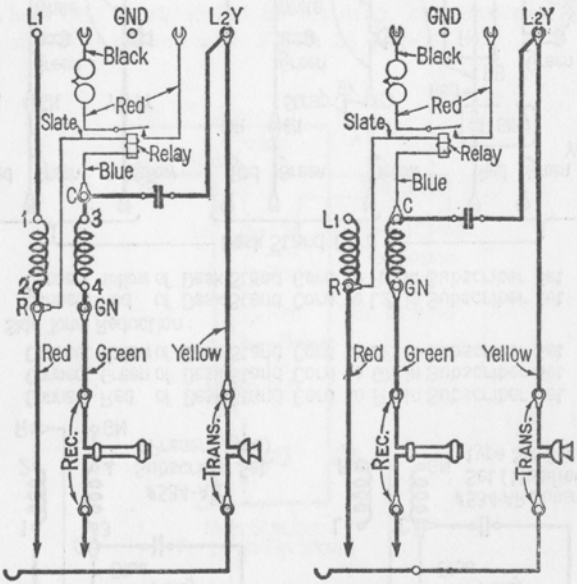


Four-Party Selective Stations:

Figure 32

Wall Set Connections

#533-AR Subscriber Set



#533-AR Subscriber Set
(Present type)

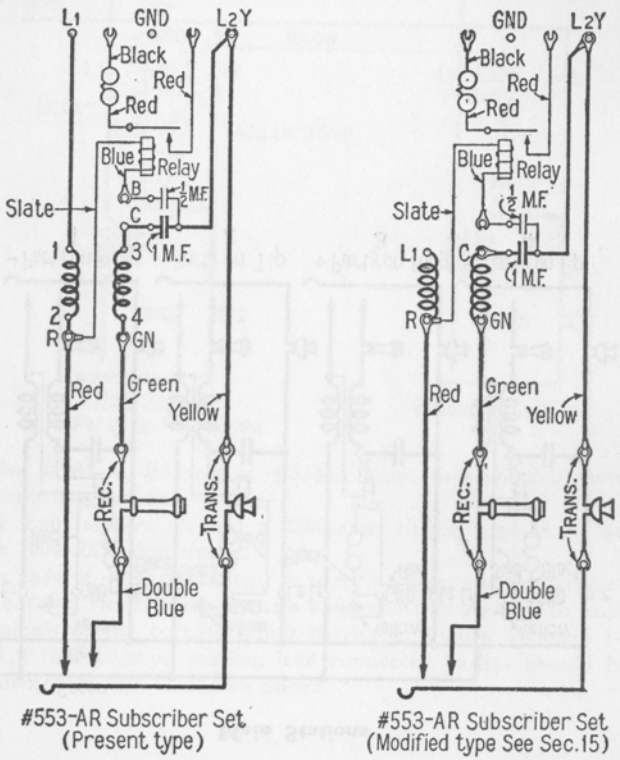
#533-AR Subscriber Set
(Modified type See Sec. 15)

For Side Tone Reduction Connect Yellow to R and Red to Y

Figure 33

Wall Set Connections

#553-AR Subscriber Set with Apparatus Blank



#553-AR Subscriber Set (Present type)

#553-AR Subscriber Set (Modified type See Sec.15)

For Side Tone Reduction Connect Yellow to R and Red to Y

Connections for #553-AR Set with apparatus blank are as above with white and double blue dial leads in set connected to "Rec." terminal to which white dial lead is soldered; yellow and black dial leads connected to "Trans." terminal to which black dial lead is soldered.

Four-Party Selective Stations:

Line and Ringer Connections

Figure 34

Main Stations

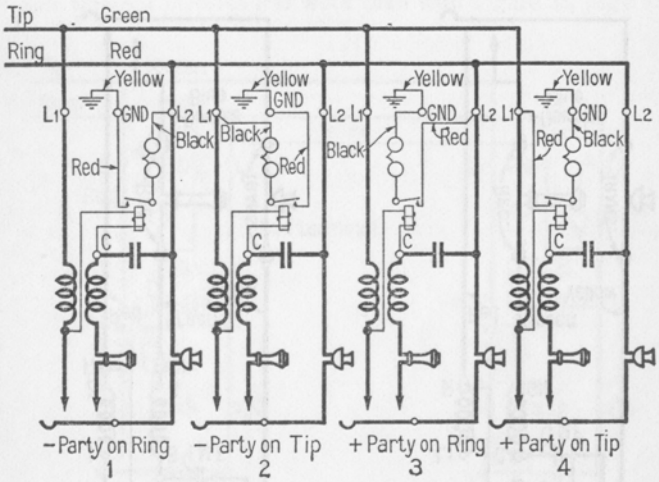
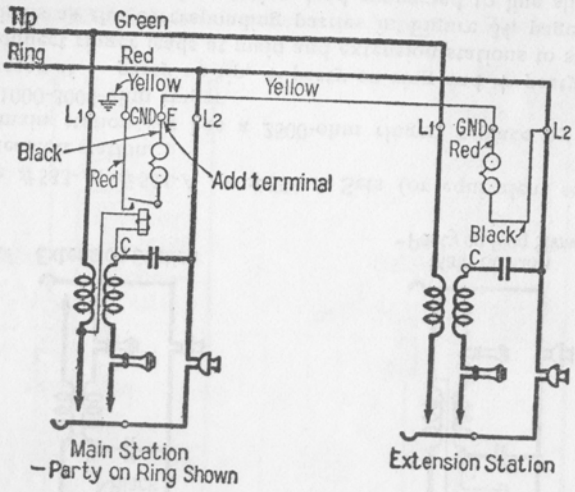


Figure 35

Main Station and Extension Station with Ringer



Use #533-A, #534-A or #553-A Sets (or equivalent sets) at extension station.

If main station set has a 2500-ohm ringer, replace by set with 1000-3000-ohm ringer.

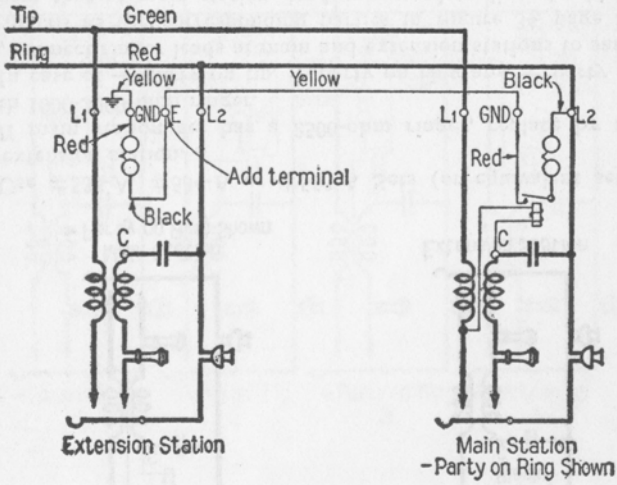
In case of — party on tip, + party on ring and + party on tip, connect ringer leads at main and extension stations to same terminals as the corresponding parties in Figure 34, page 54, except that at main station, lead connected to line should be connected to "E" as shown above.

Four-Party Selective Stations:

Figure 36

Main Station and Extension Station with Ringer
Extension Station Near Entrance

Use where it involves less work than with Figure 35, page 55.



Use #533-A, #534-A or #553-A Sets (or equivalent sets) at extension station.

If main station set has a 2500-ohm ringer, replace by set with 1000-3000-ohm ringer.

In case of — party on tip, + party on ring and + party on tip, connect ringer leads at main and extension stations to same terminals as the corresponding parties in Figure 34, page 54, except that at extension station, lead connected to line should be connected to "E" as shown above.

Main Station and Extension Station without Ringer

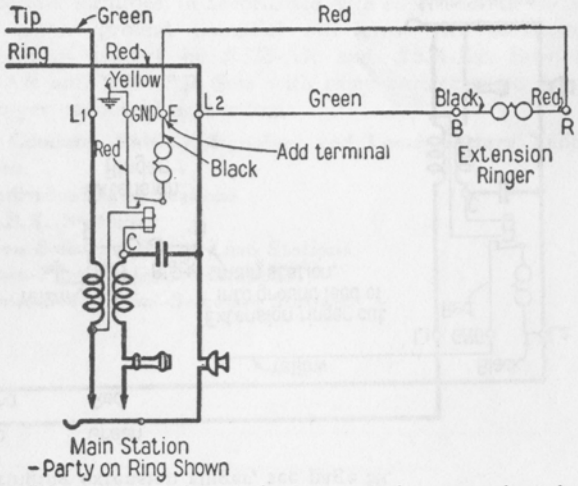
Where desk stand only is used at extension stations, connect to main station set as in Figure 6, page 29.

Where desk stand with #534-C Set (or equivalent) or wall set (#533-A or #553-A Set with ringer disconnected) is used at extension station, bridge set on line same as main station set. See Section 11, page 24.

Figure 37

Main Station with Extension Ringer (Normal Ringing)

For loud ringing extension ringer, see page 59.



Use #534-DF Set (or equivalent set) for extension ringer. If main station set has 2500-ohm ringer, replace by set with 1000-3000-ohm ringer.

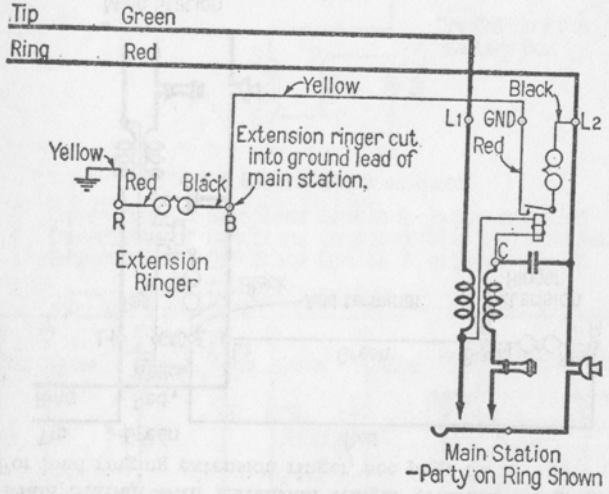
In case of — party on tip, + party on ring and + party on tip, connect ringer leads at main station to same terminals as the corresponding parties in Figure 34, page 54, except that ringer lead connected to line should be connected to "E." Connect one extension ringer lead to line as corresponding parties in Figure 34 and connect other extension ringer lead to "E" as shown above.

Four-Party Selective Stations:

Figure 38

Main Station with Extension Ringer Cut into Signaling Ground Wire (Normal Ringing)

Use where it involves less work than Figure 37, page 57, except on lines equipped with auxiliary long line equipment. For loud ringing extension ringer, see page 59.



Use #534-DF Set (or equivalent set) for extension ringer. If main station set has 2500-ohm ringer, replace by set with 1000-3000-ohm ringer.

In case of — party on tip, + party on ring and + party on tip, connect ringer leads at main station to same terminals as corresponding parties in Figure 34, page 54. Connect one extension ringer lead to ground connection as in corresponding parties in Figure 34, page 54, and connect other extension ringer lead to "GND" terminal.

Main Station with Extension Ringer (Loud Ringing)

Where loud ringing bell only is required, connect ringer of #392-D set in place of main station ringer.

Where loud ringing bell is required in addition to main station ringer, no other party shall be connected to same side of line. Connect loud ringing bell (ringer of #392-D Set) in parallel with entire winding of main station ringer, connecting unbiased side of loud ringing bell to terminal "K" in main set.

22. Use of No. 553-AR and No. 554-AR Sets for severe ground potential conditions.

In certain localities, in accordance with supplemental instructions, where ground potential interferes with satisfactory operation of ringers in #533-AR and #534-AR Sets, use #553-AR and #554-AR Sets with relay connected to ground and ringer connected across line.

23. Common Battery Signaling and Local Battery Talking Stations.

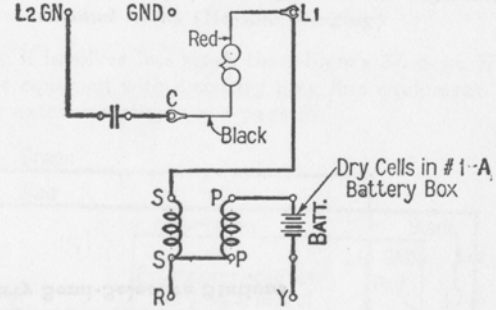
Individual Line Stations
P.B.X. Stations
Non-Selective Party Line Stations
Two-Party Selective Stations
Four-Party Semi-Selective Stations

Common Battery Signaling Local Battery Talking Stations:

Figure 39

Desk Stand Connections

Ringer shown connected as for Individual Line Station.



#534-Y Subscriber Set or equivalent

Connect Red of Desk Stand Cord to R in Subscriber Set
Connect Green of Desk Stand Cord to L2 GN in Subscriber Set
Connect Yellow of Desk Stand Cord to Y in Subscriber Set

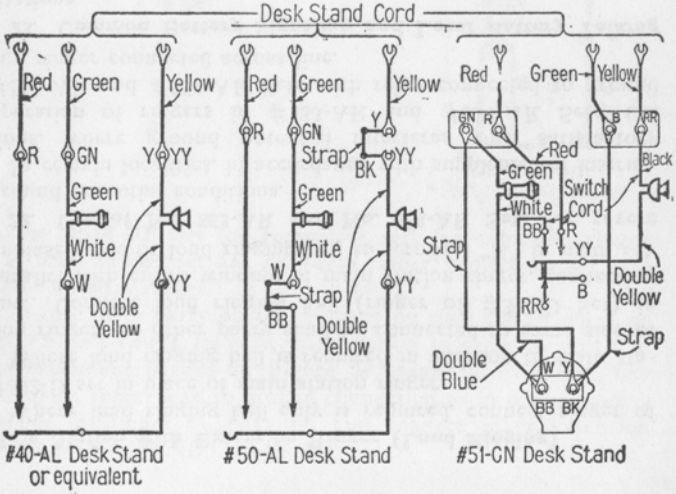
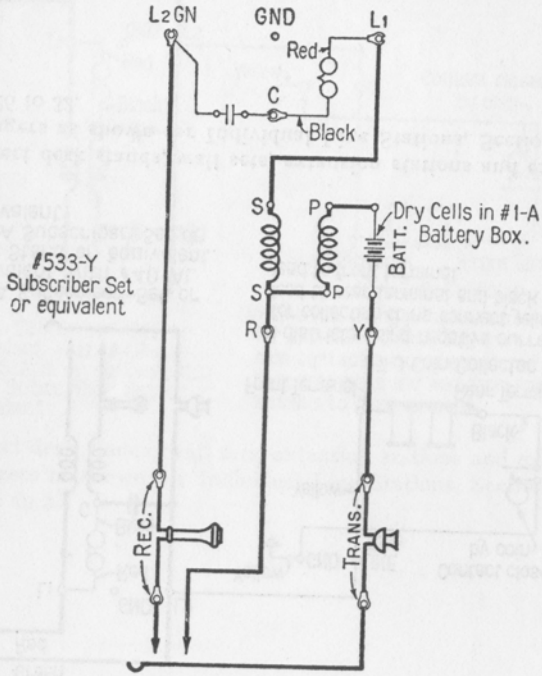


Figure 40

Wall Set Connections

Ringer shown connected as for Individual Line Station.



Line and Ringer Connections

Connect as for corresponding common battery stations.

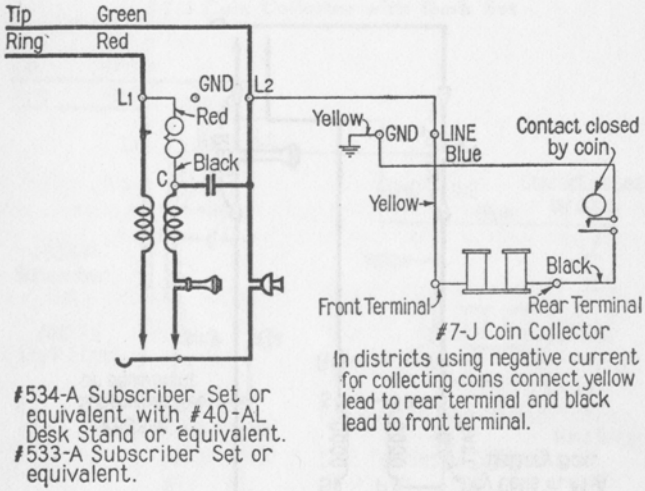
Pole receiver by connecting so that line current increases pull on diaphragm with receiver off hook. This pull is increased with "Z" terminal of receiver connected to switchhook contact when ring of line is connected to L1. When line is reversed at two-party selective and four-party semi-selective stations, connect "Z" terminal of receiver to "GN."

24. Coin Collector Stations.

#7 Type Single Coin Collectors at Individual Line Stations

Figure 41

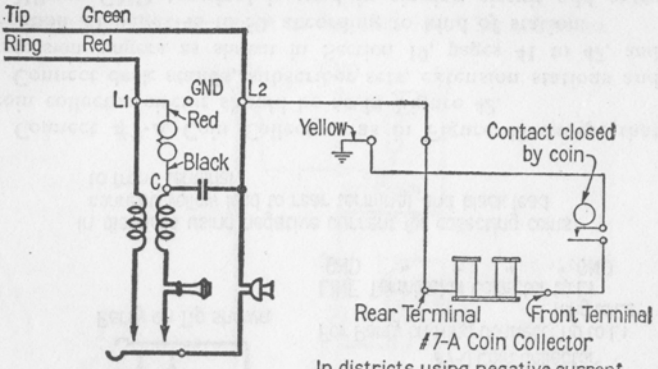
#7-J Coin Collector with Desk Stand or Wall Set



Connect desk stands, wall sets, extension stations and extension ringers as shown for Individual Line Stations, Section 16, pages 26 to 32.

Figure 42

#7-A Coin Collector with Desk Stand or Wall Set



#534-A Subscriber Set or equivalent with #40-AL Desk Stand or equivalent.
#533-A Subscriber Set or equivalent.

In districts using negative current for collecting coins, lead from coin contact should be soldered to rear terminal and lead from line terminal to front terminal.

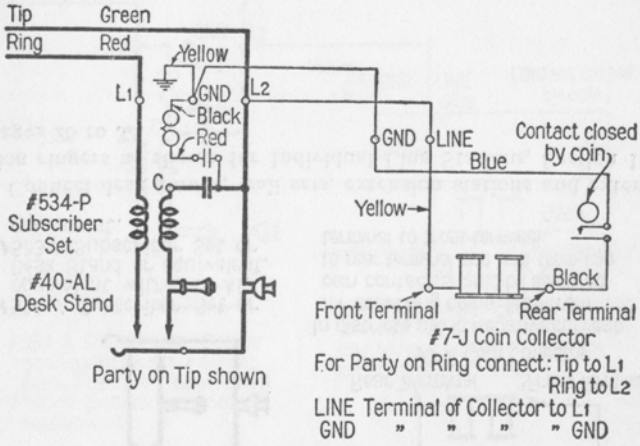
Connect desk stands, wall sets, extension stations and extension ringers as shown for Individual Line Stations, Section 16, pages 26 to 32.

Coin Collector Stations:

#7 Type Single Coin Collectors at Two-Party Selective and Four-Party Semi-Selective Stations.

Figure 43

#7-J Coin Collector with Desk Set



In districts using negative current for collecting coins connect yellow lead to rear terminal and black lead to front terminal.

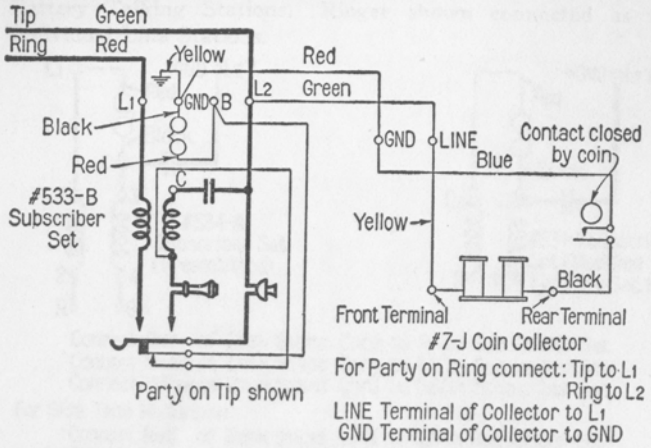
Connect #7-A Coin Collectors as in Figure 43 except that coin collector circuit should be as in Figure 42.

Connect desk stands, subscriber sets, extension stations and extension ringers as shown in Section 19, pages 41 to 47, and Section 20, pages 48 to 50, according to kind of station.

Where GND terminal is used in ringing circuit add extra terminal in set for this purpose and use GND terminal for ground connection to coin collector.

Figure 44

#7-J Coin Collector with Wall Set



In districts using negative current for collecting coins connect yellow lead to rear terminal and black lead to front terminal.

Connect #7-A Coin Collectors as in Figure 44 except coin collector circuit should be as in Figure 42.

Connect wall sets, extension stations and extension ringers as shown in Section 19, pages 41 to 47, and in Section 20, pages 48 to 50, according to kind of station.

Where GND terminal is used in ringing circuit add extra terminal for this purpose and use GND terminal for ground connection to coin collector.

25. Desk Stand for Use with Head Receiver Only.

This stand (#52-AB) is for use where subscriber desires a head receiver but no hand receiver. The switchhook is designed to hold a #3-D Headband with the No. 528 Receiver. Connections are as shown for #51-AL Desk Stand in Figure 1, page 26.

26. Desk Stands with Transmitter Cutout Buttons.

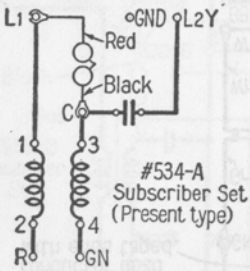
This type of stand is to be used only as specified under "Use of Desk Stand with Transmitter Cutout Button," Section 29, page 71.

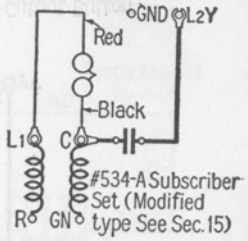
Individual Line Stations
P.B.X. Stations
Non-Selective Party Line Stations
Two-Party Selective Stations
Four-Party Semi-Selective Stations
Four-Party Selective Stations
Common Battery Signaling Local Battery Talking Stations

Figure 45

Desk Stand Connections

At all stations except Common Battery Signaling Local Battery Talking Stations. Ringer shown connected as for Individual Line Stations.

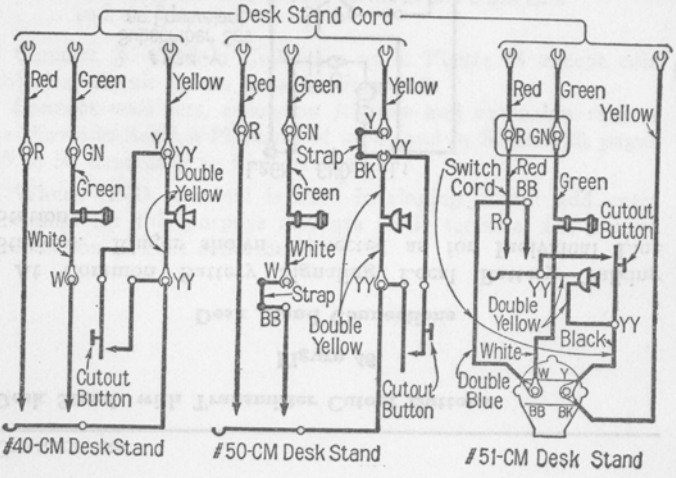




Connect Red of Desk Stand Cord to R in Subscriber Set
Connect Green of Desk Stand Cord to GN in Subscriber Set
Connect Yellow of Desk Stand Cord to L2Y in Subscriber Set

For Side Tone Reduction:

Connect Red of Desk Stand Cord to L2Y in Subscriber Set
Connect Yellow of Desk Stand Cord to R in Subscriber Set

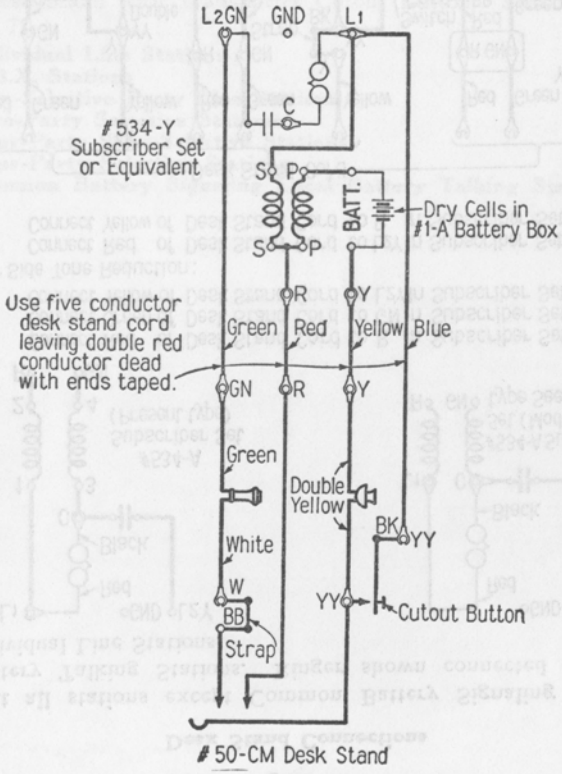


Desk Stands with Transmitter Cutout Buttons:

Figure 46

Desk Stand Connections

At Common Battery Signaling Local Battery Talking Stations. Ringer shown connected as for Individual Line Stations.



27. Keys and Switches to Silence Ringers.

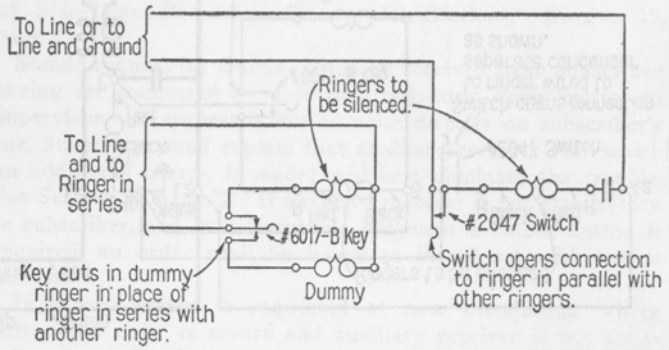
Keys and switches may be installed for temporarily cutting out ringers at main stations, extension stations or extension ringers. Where this is done, the arrangement should insure at least one ringer connected to the line at all times to receive calls.

Where the ringer to be silenced is in series with another ringer, it is necessary to have the key cut in a dummy ringer in place of the ringer to be silenced. To make dummy ringer, take ringer of same type as ringer to be silenced and tighten armature stop screw and lock nut so that armature cannot operate.

In case of a loud ringing bell, a normal ringer of the corresponding type should be used for the dummy.

Figure 47

All Ringers Except High Impedance Type

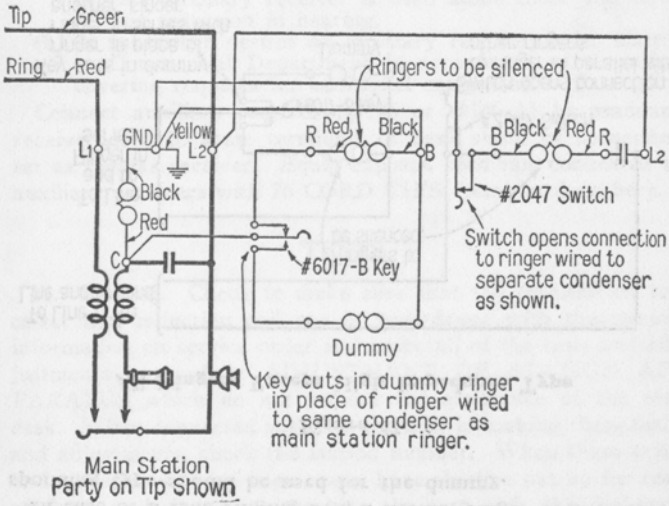


For line and ringer connections and condensers required, see main and extension station connections applying to class of line on which ringer or ringers are to be silenced.

Keys and Switches to Silence Ringers:

Figure 48

Where High Impedance Ringers are Used on Two-Party Selective and Four-Party Semi-Selective Lines



EQUIPMENT FOR NOISY PLACES

28. General—If telephone is located in a noisy place subscriber may have difficulty in hearing due to—

(a) Noise reproduced in receiver by the transmitter (side tone).
(b) The effect of noise directly on ear.
(c) Both (a) and (b).

Noisy conditions are most likely to be found in factories, in large offices where there are many people, near elevated or other railroads, or noisy streets, etc.

On complaint of subscriber, noise may be reduced or overcome according to Sections 29 and 30.

NOTE: Noisy instrument may be caused by receiver diaphragm touching pole pieces. Make sure noise is not due to this cause before making other changes.

29. Use of Desk Stand with Transmitter Cutout Button—All Stations.

If subscriber requests cutout button and complaint is found to be due to side tone, follow instructions given under "Use of Side-Tone Reduction Circuit—All Stations," Section 10, page 23.

Should request for cutout button be received from subscriber having set connected for side tone reduction, refer matter to Supervisor. If request is due to noise directly on subscriber's ear, Supervisor shall explain that auxiliary receiver (for which an additional charge is made) will best eliminate the trouble. See Section 30, page 72. If auxiliary receiver is not satisfactory to subscriber, and in Supervisor's judgment a cutout button is required, an order shall be issued to install set with cutout button.

If cutout button is requested at new installation where extraneous noise is severe and auxiliary receiver is not satisfactory to subscriber, an order shall be issued to install set with cutout button.

NOTE: If subscriber desires cutout button for purpose of preventing a person at other end of an established connection overhearing private conversation between subscriber and others near him, a desk stand with cutout button may be installed on approval of Supervisor.

30. Use of Auxiliary Receivers—All Stations.

In case difficulty in hearing is due to noise directly on ear, proceed as follows:

(a) Advise subscriber that an auxiliary receiver (for which an additional charge is made) will improve his hearing when used in conjunction with regular receiver, but that in case auxiliary receiver is used alone there will be a serious reduction in hearing.

(b) If subscriber desires an auxiliary receiver, refer matter to Commercial Department in accordance with routine covering requests for additional equipment.

Connect auxiliary receiver (#146 or #146-A) by standard receiver cord to same terminals of desk stand or subscriber set as regular receiver. Equip exposed cord tips connected to auxiliary receivers with 76 CORD TIPS (semi-hard rubber).

TESTS

31. General. Check to make sure that the transmitter, receiver and induction coil are in accordance with the zoning information on service order and make all of the tests and adjustments covered in ADJUSTMENT OF STATION APPARATUS which do not require the assistance of the test desk. When connected with the operator in making these tests and adjustments, check the station number. When these tests and adjustments have been made, have the line put up for test at the test desk. After reaching the test desk, the deskman will make the tests given in Sections 32 and 33 below.

32. Tests with Receiver on Hook. At the request of the deskman, "hang up" while he makes the required tests to determine that the line is in satisfactory condition. Should any bell tapping occur during these tests, advise the deskman.

33. Tests with Receiver Off Hook. After completing the above tests the deskman will ring the station. Leave the receiver off the hook while he makes the tests outlined below.

1. Current Flow Test

While this test is being made, shake the cords, particularly where they enter the equipment and listen for cutouts, noisy cords and loose connections. Clear any defects found.

2. Transmission Talking Test and Instrument Zoning Check.

After the above tests are completed, make a talking test with the deskman to determine whether the transmission is satisfactory. During this talking test the deskman will ask for information such as: subscriber's address, check of type of receiver, transmitter and induction coil, and whether or not station is wired for side-tone reduction. The above information should be in accordance with the zoning instructions on the service order.

In making the talking test, take care when talking into the transmitter to maintain a uniform volume at the proper distance from the transmitter. If, during conversation between deskman and installer, volume in either direction seems to be below the amount normally obtained, this indicates trouble which should be cleared.

If during any of the above tests burning or frying noises are noticed, this may be due to the cords, transmitter or loose connections. To determine if the cords are causing this trouble, shake them and if this varies the burning or frying noise, the cord or cords causing the noise should be replaced. If the noise continues, this indicates a faulty transmitter which should be replaced or a loose connection which should be cleared.