INSTALLATION - 750A PBX

1. GENERAL

1.01 This section covers the general requirements and methods for installing the No. 750-A P B X

1.02 This section is reissued to convert it to letter size and to incorporate material from the addendum in its proper location. In the process of this conversion, marginal arrows have been omitted.

1.03 Both the metallic return and ground return feeder arrangements are covered herein. To minimize noise effects on P B X stations and to prevent possible electrolysis damage to lead sheath cables or underground pipes, the ground return feeder arrangement should not be used when additions or changes in the P B X facilities are involved unless authorized by specific local instructions.

2. TOOLS AND MATERIALS

2.01 Certain tools and materials are specified in the practices covering specific installation methods. In addition the tools usually employed in P B X installation work comprising a hammer, saw, screwdrivers, pliers drills, etc., will be required. Also, a small monkey-wrench for removing the square head lag screws holding the skids, a test receiver (No. 528 or equivalent) with cords and clips and a battery feeder test set per KS-7114 or a Weston triple-scale Volt-Ammeter model 280 equipped with cords and clips. A meter having voltage scales of 150, 60 and 3 volts and current scales of 30, 0.6 and 0.06 amperes will be found most suitable.

3. REQUIREMENTS AND METHODS

Preparation

3.01 If the cabinet is to be placed in a closet or wall niche where the back will be inaccessible for installing cable, it usually will be necessary to run the cable to the cross-connecting terminal before placing the cabinet in position. In this case provide the cable with a loop as shown in Fig. 1. In other cases place cabinet before running cable.

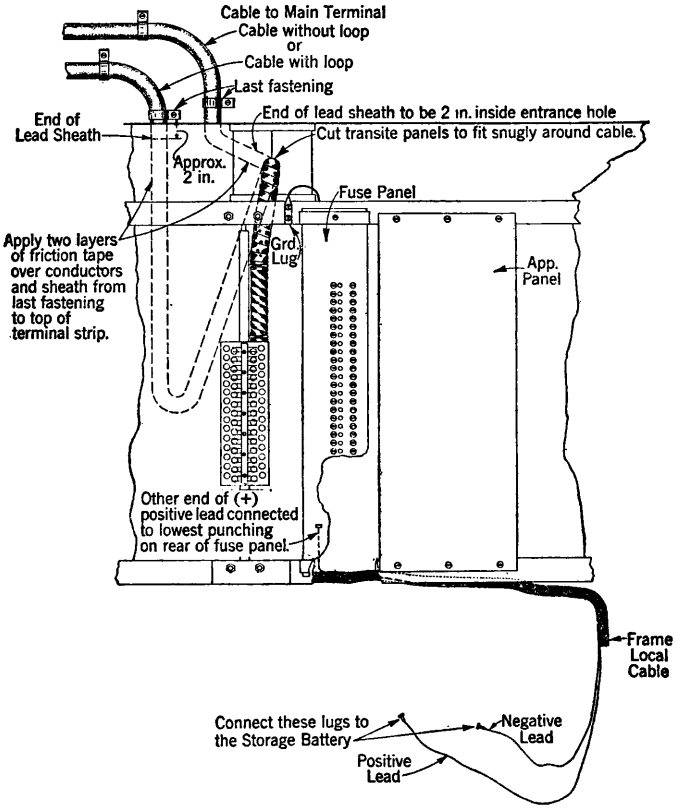


Fig. 1—Cabling of Cabinet—Front View

Construction of Wooden Base (This applies only to those cabinets not provided with a wooden base):

3.02 The wooden base shown in Fig. 2 consists of three 1/2 inch boards 3 inches wide and 2 feet 7 inches long. These strips should be prepared prior to the installation whenever possible.

3.03 Each strip should be finished all over with two coats of orange shellac or asphaltum varnish. When necessary to have the exposed edges of the platform match the cabinet finish, paint the exposed edges with paint having a "neutral green" color.

Transporting Cabinet Into Approximate Position

Handling

3.04 Handle the cabinet in the packing case whenever possible, as packing case corners are easier to grip than the metal cabinet.

3.05 Use a roller dolly whenever possible, to avoid carrying.

3.06 When necessary to carry the cabinet up or down stairs take utmost precautions to guard against personal injury. Not fewer than 4 men should handle the cabinet in such cases.

3.07 When moving the cabinet use care not to disarrange the equipment by jarring heavily when setting down.

Cabinet Preparation

Unpacking Cabinet

3.08 Remove the packing case, leaving only the skids under the cabinet.

3.09 Open the cabinet door and remove the temporary fastenings from the gate and platform.

3.10 Provide suitable pieces of wood for supporting the lowered platform while the cabinet is on the skids. This will permit opening the relay gate when removing the lag screws holding the skids, without danger of the cabinet tipping.

Bolting Frame to Bottom of Cabinet Where This Has Not Been Done by the Shop

3.11 Move the cabinet forward on the packing case skids until it overhangs the skids about 4 inches.

3.12 Open the cabinet door and lower the metal platform. Make sure that the relay gate is locked in the closed position.

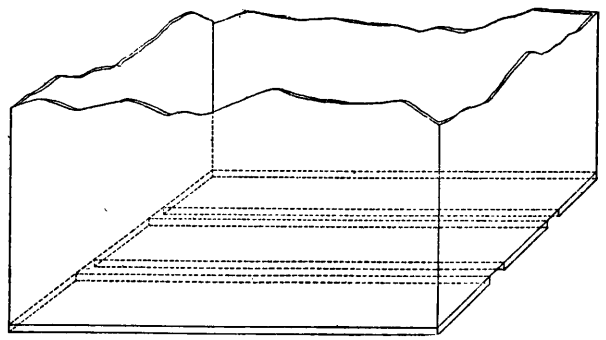
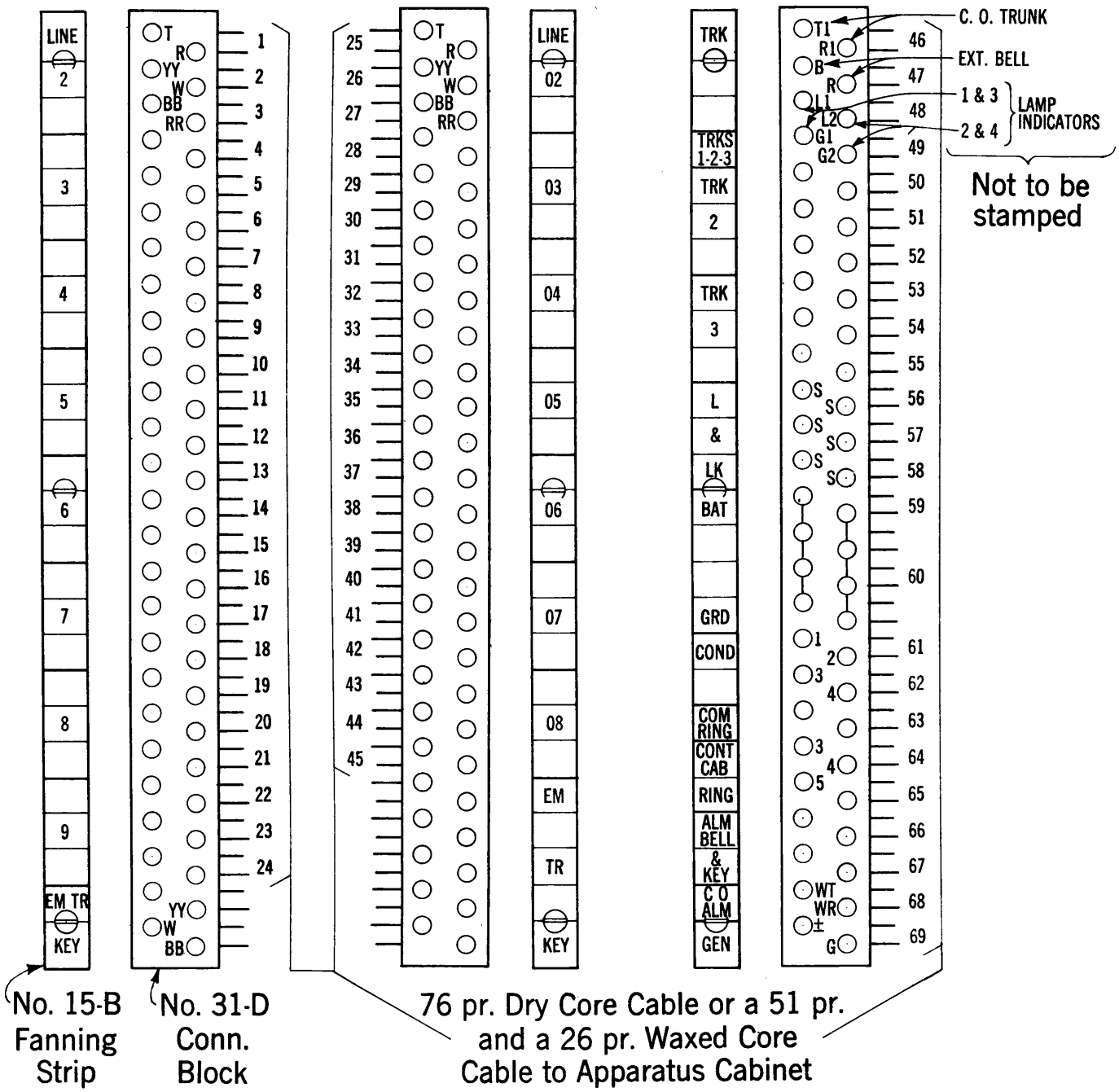


Fig. 2—Locally Constructed Wooden Base



Pairs 70 to 76 Spare
Pair numbers are not to be stamped

On some boards the designation of pair 47 is T2 and R2 instead of B and R therefore check to see that the designation used agrees with that shown on the incoming terminal strip in the cabinet.

Fig. 3—Connecting Blocks and Fanning Strips—15 Line Size

3.13 Align the two front bolt holes in the angle iron feet of the rack with corresponding holes in cabinet, using a heavy screwdriver or other suitable tool.

3.14 Raise and fasten metal platform in the closed position.

3.15 Insert from below through one of the holes a 1/2 inch cap screw 3/4 inch long. Place a 1/2 inch x 11/64 inch x 1/8 inch lock washer and a 1/2 inch jamb nut on the end of the bolt which protrudes into the cabinet.

3.16 Place a bolt in the other hole in the above manner and tighten the nuts on both bolts.

3.17 Move the cabinet backward until it overhangs the packing case skids about 4 inches.

3.18 Lower the metal platform onto the wooden supports mentioned in 3.10 and open the relay gate.

3.19 Align the two rear bolt holes. Then insert a 1/2 inch cap screw through one of the holes from below and proceed according to 3.15 and 3.16 above.

3.20 Close the relay gate and the metal platform and remove the cabinet from the packing case skids to the permanent location either directly on the floor or on a base.

Note: The cabinet need not be bolted to the floor.

Placing Cabinet in Position

Cabinet With Base Attached or Cabinet Without Base

3.21 Place in designated position in accordance with the job instructions.

Note: Cabinet should clear the wall by approximately 2 inches to give room for entering the cable. When a metallic battery charging feeder from the central office is employed, additional clearance may be necessary to avoid contact with pipes or other objects which would ground the cabinet and cause overcharging of the battery.

3.22 Check the cabinet to see that it stands approximately level. Shim up the cabinet with small strips of wood if necessary.

3.23 Open the door and lower the metal platform. Level the metal platform by adjusting the bolts and in the case of the cabinet with a wooden base attached lock them in position with the jamb nuts. Where the cabinet has no wooden base, remove the leveling bolts, shellac the entire threads and reinsert the bolts in the metal platform, leveling by adjusting the bolts.

Cabinet With Separate Base Consisting of Wooden Strips as Shown in Fig. 2

3.24 Place the cabinet in exact location but without base in position.

3.25 Tilt the cabinet forward and place the back strip under the raised bottom.

3.26 Tilt the cabinet backward slightly on previously placed strip and slip the middle and front strips into position and restore the cabinet to upright position.

Note: When the cabinet is to be located in a closet or wall niche where there is no access to the rear, place the back strip in position before placing the cabinet and then shift cabinet onto the back strip and proceed as in 3.26 for placing the other two strips.

3.27 Check the cabinet to see that it stands approximately level.

3.28 Open the door and replace the four leveling bolts in the metal platform with 1/2 inch cap screws 1-1/4 inches long. Each cap screw should have a 1/2 inch jamb nut run on as far as possible before it is screwed into the platform. Do not shellac these screws.

3.29 Lower the metal platform and adjust each cap screw to level the platform. Tighten jamb nuts to lock each bolt in position.

Note: When the cabinet is properly leveled the gate should swing freely and slide easily into position. If the gate is hard to latch refer to your supervisor for instructions relative to raising the gate on its hinge bolts if this is considered necessary.

Placing Main Cross-Connecting Terminal

Locating Box

3.30 Place in position in accordance with the job instructions and fasten to the wall as covered in the sections on house cable placing and anchoring devices of the Bell System Practices.

Placing Connecting Blocks and Fanning Strips

3.31 Place as indicated in Figs. 3 and 4. If space is provided in an existing terminal box, place connecting blocks and fanning strips as covered in the job instructions.

Lettering and Numbering

3.32 Letter and number fanning strips and connecting blocks according to Figs. 3 and 4, using 3/16 inch rubber stamps and in conformity with the Bell System Practice on "Lettering and Numbering Switchboard Equipment."

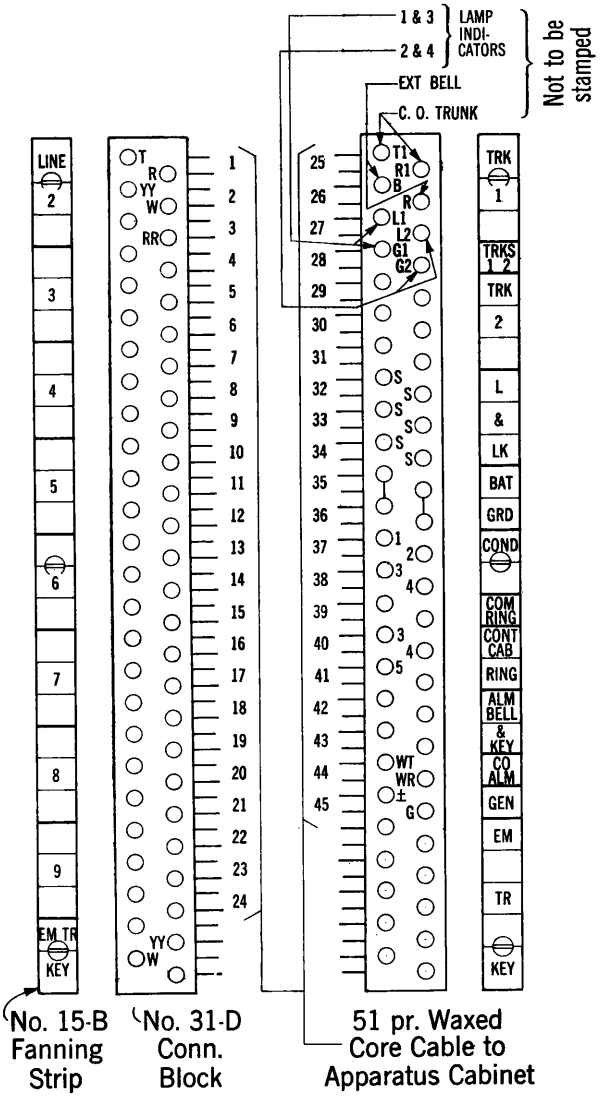


Fig. 4—Connecting Blocks and Fanning Strips—8 Line Size

Running Cable Between Cross-Connecting Terminal and Apparatus Cabinet

3.33 Run the cable in accordance with job instructions and the Bell System Practices, leaving sufficient length at the ends for terminating. See Fig. 1 for method of entering cable at the apparatus cabinet. Cable sheath should be covered with two layers of friction tape wherever it might come in contact with the cabinet.

Note: The looping of cable behind the cabinet is required only when the cabinet is to be placed in a closet or niche where the back is inaccessible. The length of the excess looped cable will depend upon local conditions.

3.34 Form, fan and sew each end of the cable for connection at the main cross-connecting terminal as shown in Figs. 3 and 4 and at apparatus cabinet according to Fig. 5.

3.35 Draw formed end of cable into terminal box, skin and connect to terminals.

3.36 Draw formed end of cable into cabinet and fasten in position.

3.37 Run groups of pairs through proper fanning holes in terminal strip, skin and connect to terminals as shown in Fig. 5.

Note: The individual conductors of pairs 32, 33 and 34 in the 8 line cabinet and 56, 57 and 58 in the 15 line cabinet should be connected to the S terminals associated with controlled keyless stations as required. Wires not used should be treated as spare wires.

Work Required on Power Wiring

3.38 **Identifying positive and negative battery leads when the lugs on the local power cables are not marked (+) and (—):** This work should be done before connecting the external charging circuit from the central office or rectifier to the battery charging circuit within the cabinet and without the water pipe ground (when used) connected. Remove all fuses which may be in place on the power apparatus panel.

(a) Connect one side of a dry cell to the framework of the cabinet. Connect the other side of the dry cell to the test clip of a head receiver. A click should be heard when the other receiver test clip is touched against the lug on the longest rubber covered battery cable in the bottom of the cabinet.

(b) Touch the test clip to the other lug and make sure that no click is heard.

Note: The cable lugs should not rest on any metal part of the cabinet during the test.

(c) Tag the lug that is touched when click is heard or designate it in some other suitable manner for connection later to the positive (+) terminal of storage battery.

Changing Lugs on Willard P-128 Cables to Exide Lugs

3.39 When installing Exide BI-5 battery in a P.B.X. equipped with Willard P-128 power leads obtain an extra Exide intercell connector (Exide cable No. 20272). Cut this cable at the middle and skin the free end of each piece.

3.40 Cut the lug from each P-128 cable connector and skin

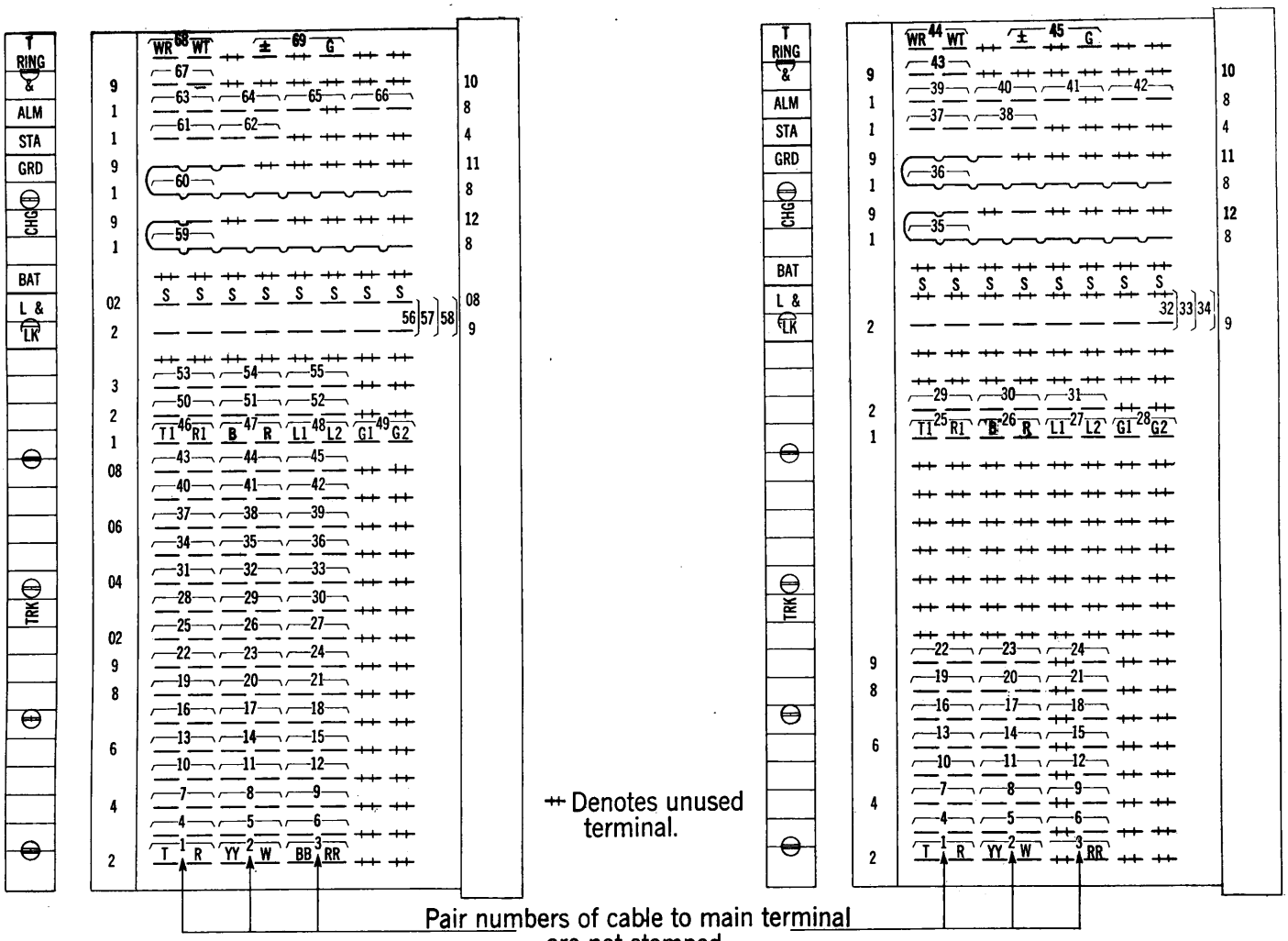


Fig. 5—Incoming Terminal Strip

3.41 Splice one-half the intercell cable No. 20272 to each P-128 cable, using a straight splice.

Installing Ground Connection

3.42 When a ground return central office battery feeder is installed run a No. 14 ground wire from the ground lug on the frame shown in Fig. 1 or from the ground terminals in the main cross-connecting terminal shown in Figs. 3 and 4 to a ground clamp on a cold water pipe as covered in the Bell System Practices. When a rectifier is installed this ground wire may be run to a ground rod if connection cannot be made to a suitable water pipe.

Caution: Do not run this ground connection when a metallic central office battery feeder is used.

Installing Storage Battery

3.43 **When battery is furnished from a local storeroom where it has been given a freshening charge** and is ready for service, proceed as follows:

(a) Remove battery jars, trays and connectors from shipping case.

(b) Inspect each battery jar to see that the electrolyte is at proper height and that the white ball is at the top of the cage. Bring to the attention of your supervisor any unusual condition.

(c) Place the 4 rubber trays in position in the apparatus cabinet in front of the vent holes.

(d) Place the battery jars in the trays with positive (+) terminals facing front of the cabinet. Each cell should be lined up opposite the vent hole in the back of the cabinet.

(e) Connect the positive (+) terminal of the right-hand jar to the negative (—) terminal of the next jar by one of the 3 short connector cables as shown in Fig. 6 according to the type of battery. Connect successive jars in the same manner.

Caution: Lugs must be connected to battery terminals exactly as shown to prevent possibility of contact with cabinet which might short-circuit the cells.

(f) Connect the long power cable designated (+) to the positive (+) terminal of the left-hand jar and the other long power cable to the negative (—) terminal of the right-hand jar as shown in Fig. 6.

(g) Place the cover over battery and see that the cables enter through the opening in the lower right side of the cover and that the transite fits snugly around the cables and is fitted into the details provided for it on the cover.

3.44 **When battery is furnished with dry plates** set it up in accordance with the practice relating to the initial charging of enclosed type storage batteries. Place the cells in the cabinet, add electrolyte and connect to power wiring as provided in 3.43 (c) to (g). When charging arrangements are ready the battery should be given a freshening charge.

Checking Central Office Charging Conductors

3.45 Check the central office feeders for proper condition as follows:

(a) Connect the (—) terminal of the voltmeter to the left-hand post of the No. 50-C protector mounting designated "CHG" when no "RHEO" fuse is used, otherwise connect to the bottom post of the protector mounting designated "RHEO" and the (+) meter terminal to the ground lug on the cabinet framework (See Figs. 1 and 7). Cut out all resistance in the Ward-Leonard resistor and the rheostat and remove the fuse from the protector mounting that is used for this test if previously installed.

(b) Observe the voltage reading for a few minutes. Conditions causing an unsteady voltage should be corrected before proceeding. (If the meter shows a reading off scale on the zero side, this is an indication that the polarity is reversed and should be corrected.)

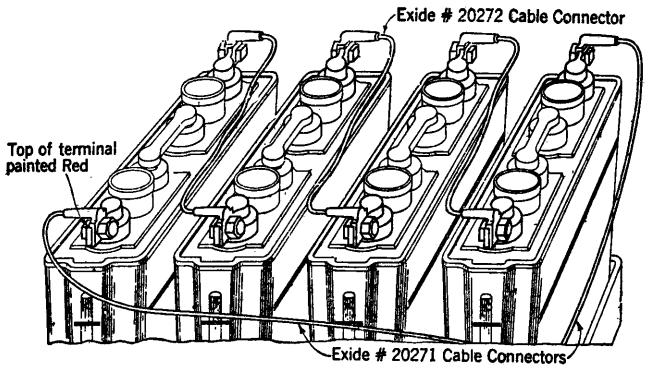
(c) When the meter indicates that the feeder is in proper condition for use, disconnect the voltmeter.

Note: Where negative side of central office battery is grounded, employ only a metallic feeder and reverse tip and ring conductors at the main cross-connecting terminal so that the positive side of the P.B.X. battery will be connected to the positive side of the central office battery.

Placing Battery on Operating Charge

Central Office Charging

3.46 When the cabinet is equipped with an apparatus panel and fuse protector mountings as shown in Fig. 7-(A), connect the (—) and (+) terminals of the ammeter to the left and right fuse posts respectively of the upper protector mounting designated "CHG." When the cabinet is equipped with an apparatus panel and fuse protector mountings as shown in Fig. 7-(B), connect the (+) and (—) terminals of the ammeter to the top and bottom fuse posts respectively of the protector mounting designated "RHEO." Adjust the current by means of the rheostat and Ward-Leonard resistor to approximately 300 milamperes during the installation and testing-out period. When the tests have been completed see that the charging rate is established in accordance with the job instructions if no charge control equipment is provided.



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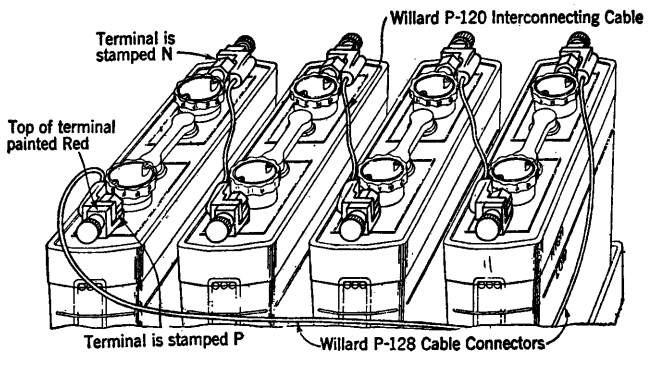

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Fig. 6—Battery Connections

3.47 When the tests have been completed and if charge control equipment has been provided, place a strap temporarily around the Ward-Leonard resistor and rheostat, short-circuiting all of this resistance. See that the current indicated by the ammeter is not in excess of one ampere, which is the maximum current that may be used for the higher rate of charge with cable pair charging. Remove the temporary strap and adjust the trickle charge rate by means of the rheostat and Ward-Leonard resistor to about 150 milamperes for the relay method of charge control or to about 100 milamperes if an ampere-hour meter is used for charge control.

3.48 When current is properly established place the proper fuse on the protector mounting and disconnect the meter. Also place the proper fuses on the apparatus panel.

Rectifier Charging

3.49 Connect the ammeter to the protector mounting as covered in 3.46 and plug the rectifier into the electric service outlet.

3.50 Strap out all resistance in the Ward-Leonard resistor and turn rheostat to the left, short-circuiting all of its resistance.

3.51 Build up charging current to 300 milamperes during the installation and test-out period by adjusting the rectifier as provided in the section in the Division covering installation of the copper oxide rectifier. When the tests have been completed see that the charging rate is established in accordance with the job instructions if no charge control equipment is provided.

3.52 When charge control equipment is provided readjust the rectifier output to one-half ampere, which is the maximum current that may be obtained for the higher rate of charge with rectifier charging, then proceed with the adjustment of the trickle charge rate in accordance with 3.47.

3.53 Place the proper fuse on the protector mounting and disconnect the meter. Also place the proper fuses on the apparatus panel.

Miscellaneous Work Items

Connections in Main Cross-Connecting Terminal for Emergency Trunk Key

3.54 Follow Fig. 8 when connecting conductors in main cross-connecting terminal from emergency key, associated station and central office trunk that is designated for emergency service.

3.55 Cross-connect these terminals to the terminals of the line and trunk that are to be associated with the emergency key.

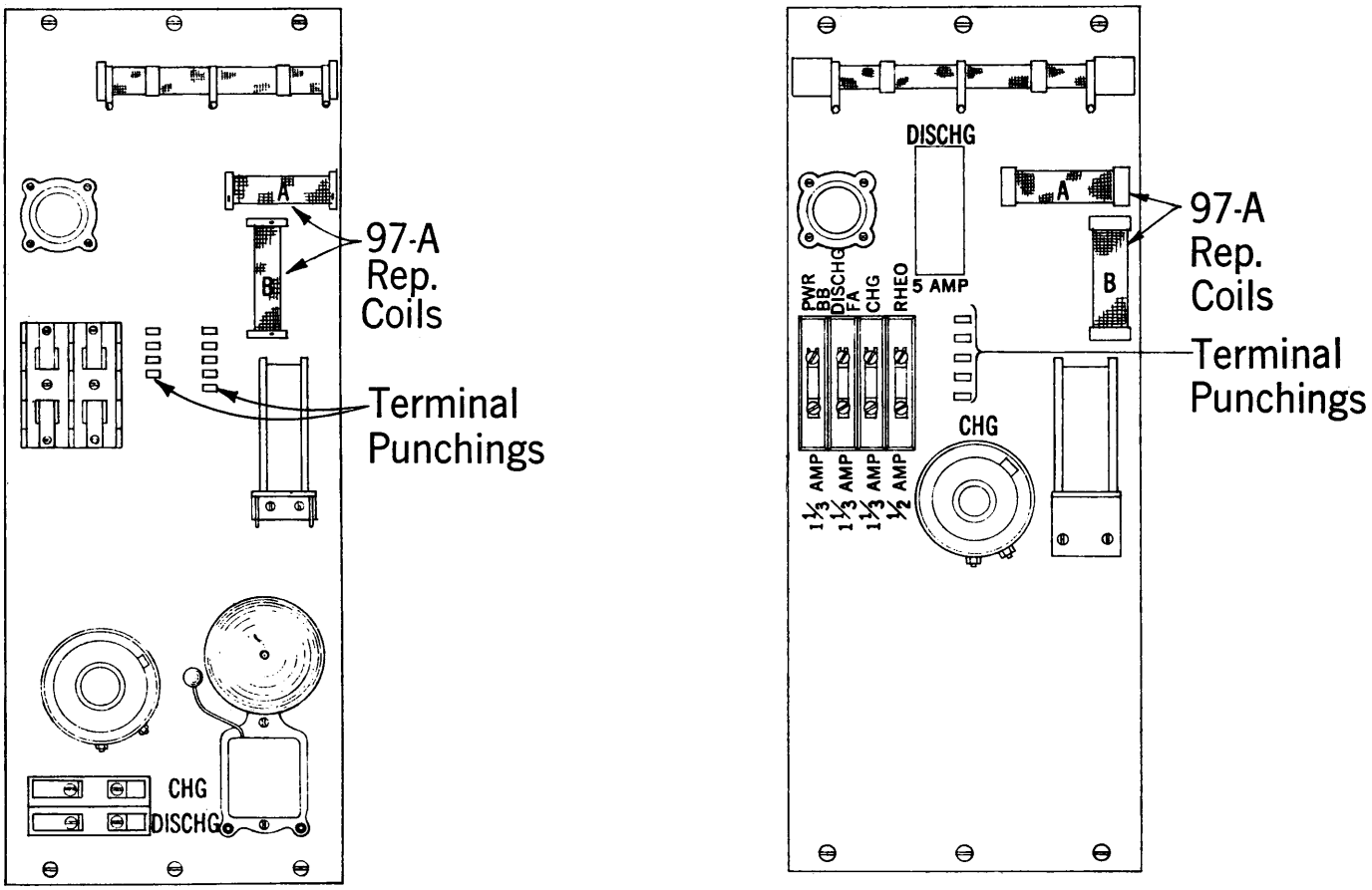


Fig. 7—Apparatus Panel

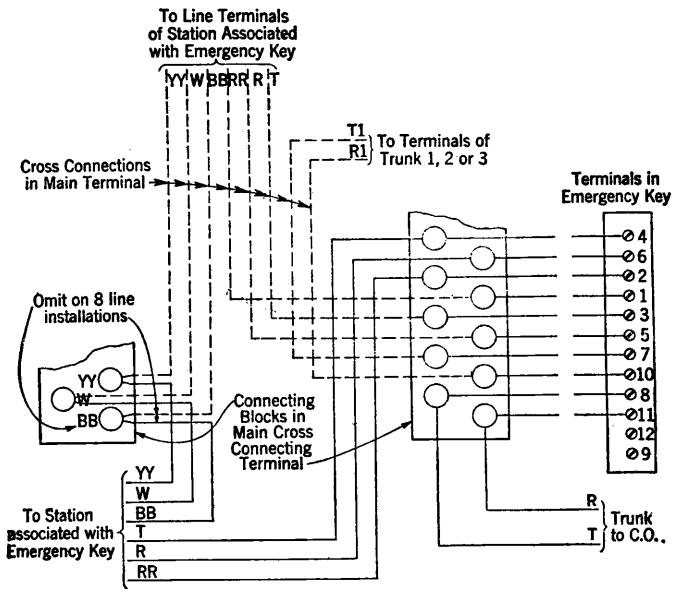


Fig. 8—Emergency Trunk Key Wiring

Connections on No. 199-A Terminal Strips

3.56 Alter strapping arrangement on the terminals, if necessary to provide the required service features. The strapped connections for the various features are specified in Fig. 9 covering the 15 line cabinet and Fig. 10 covering the 8 line cabinet.

Installation of Resistance Lamp

3.57 When a control cabinet is installed place the proper resistance lamp in the receptacle on the apparatus panel.

Installation of Grounding Fuses for Exposed Battery Feeders

3.58 When grounding fuses for exposed battery feeders are required locate the 50-C protector mountings and the associated 2 ampere fuses in the cross-connecting terminal box serving the P.B.X. and connect in accordance with the circuit drawing.

Installation of Copper Oxide Rectifier

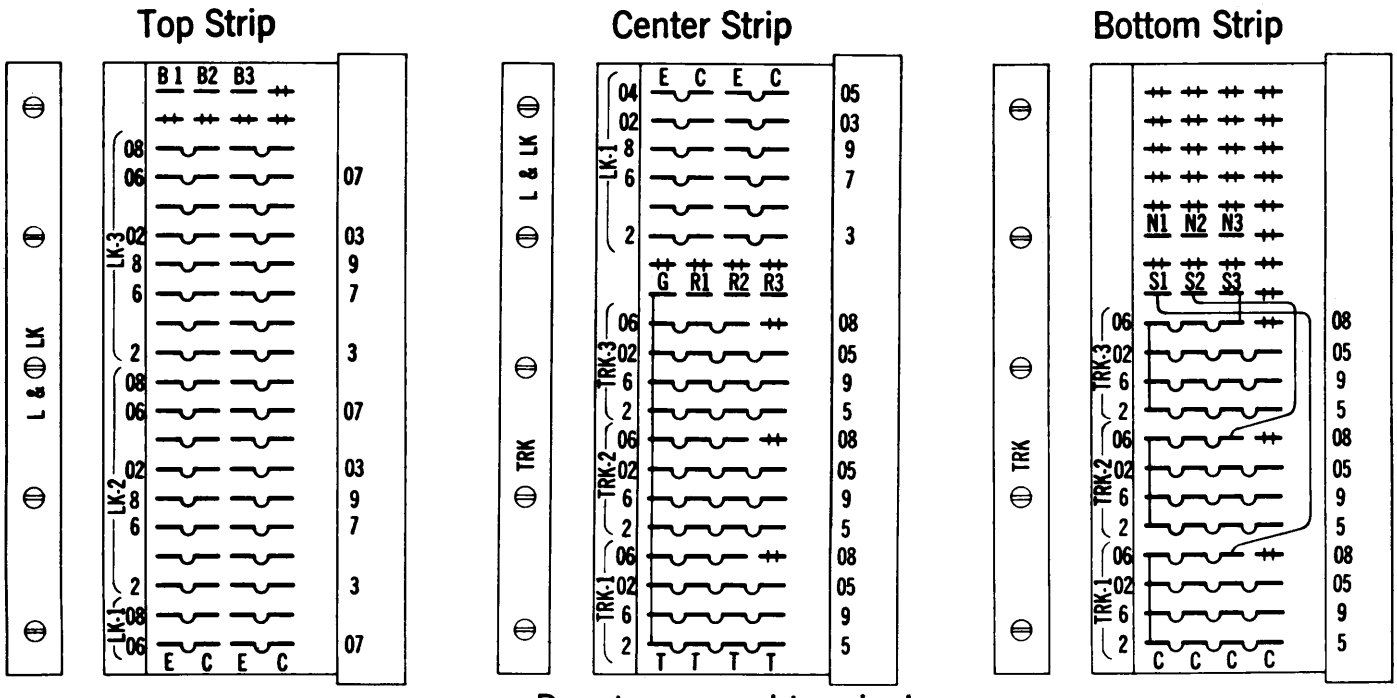
3.59 When a copper oxide rectifier is to be provided refer to the section in the Division covering the installation of this equipment.

Installation of Ringing Machine

3.60 When a ringing machine is to be provided refer to the section in the Division covering the installation of this equipment.

4. INSTALLATION TESTS

4.01 The tests and inspections required in connection with the installation work as covered by Section 548-500-230 should be made before turning the equipment over to the customer for use.

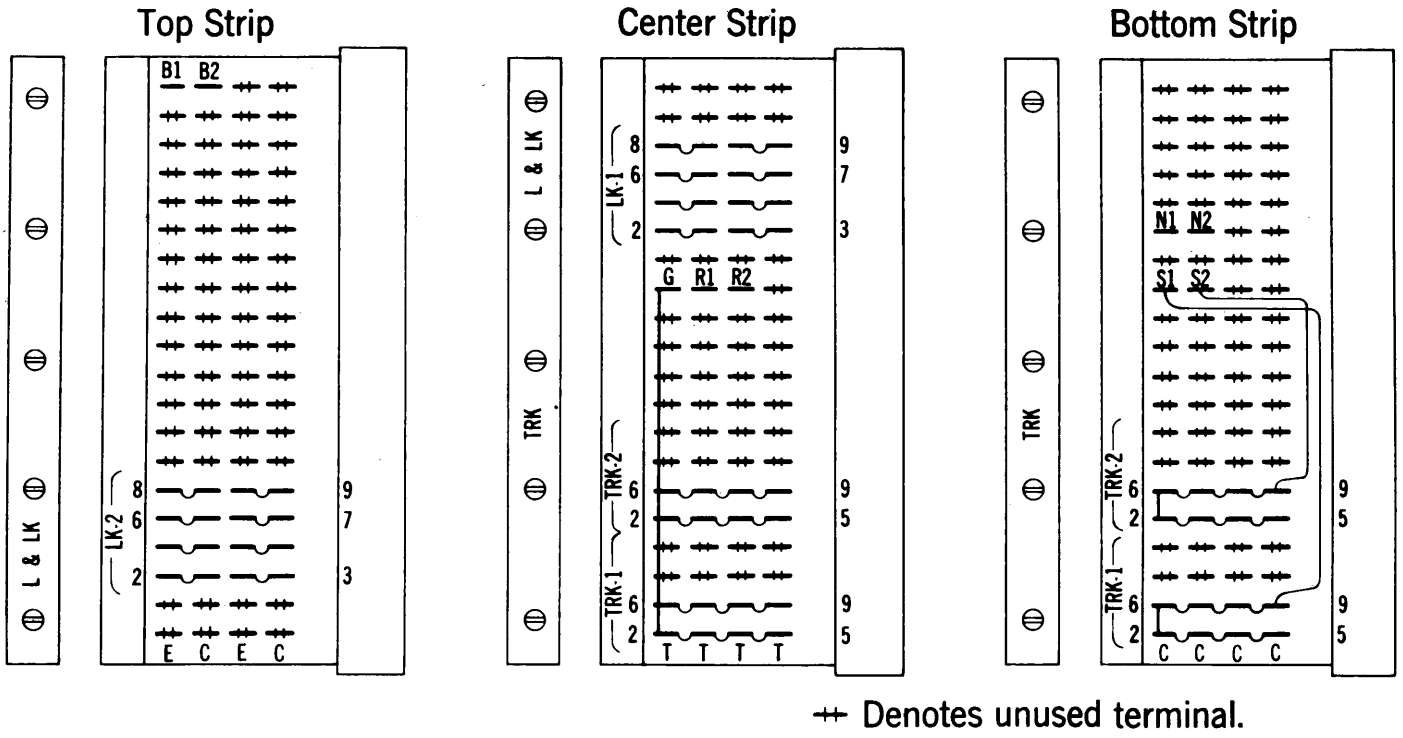


(E) and (C) punchings of corresponding working lines are strapped. Remove this strap from non-working lines at each link and strap these (C) punchings to corresponding (B) punchings.

(G) punching shown strapped to all (T) punchings for unrestricted outward C.O. service. To restrict a station from making out C.O. calls, remove this strap from its (T) punching and strap the (T) punching to the (R1), (R2)or(R3) punching according to trunks to be restricted.

(S1), (S2) and (S3) punchings shown strapped to all (C) punchings of associated trunk for secrecy on trunk connections. To give station non-secrecy remove this strap from (C) punching and strap the (C) punching to the proper (N1), (N2) or (N3) punching.

Fig. 9—No. 199-A Terminal Strips—15 Line Size



(E) and (C) punchings of corresponding working lines are strapped. Remove this strap from non-working lines at each link and strap these (C) punchings to corresponding (B) punchings.

(G) punching shown strapped to all (T) punchings for unrestricted outward C.O. service. To restrict a station from making out C.O. calls, remove this strap from its (T) punching and strap the (T) punching to the (R1) or (R2) punching according to trunks to be restricted.

(S1) and (S2) punchings shown strapped to all (C) punchings of associated trunk for secrecy on trunk connections. To give station non-secrecy remove this strap from (C) punching and strap the (C) punching to the proper (N1) or (N2) punching.

Fig. 10—No. 199-A Terminal Strips—8 Line Size