

BASIC COMMON WIRING INFORMATION

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<u>1. GENERAL</u>	2.102	Where it is necessary to connect battery, ground, or other common wires to strip mounted apparatus, such as relays, lamps, or jacks, the common wires shall be run in the cable form to the nearest strip of apparatus, and the loop wires shall be run in the form to the other strips of apparatus. The common or loop wires at each strip or mounting plate should be brought out of the form at the same point as the regular skimmers to the nearest equipped piece of apparatus on each strip except as stated in PAR. 2.1021 and 2.1022. The loop wires shall be included in the cable form only when all the wires are to be placed in the form.
1.1 <u>Scope of Section</u>	2.1021	An exception is made to the requirement stated in PAR. 2.102 in the case of equipment mounted on panel system single and double sided frames where the common leads are being brought in to the first apparatus position (either equipped or unequipped). Where such terminations unavoidably occur at unequipped apparatus positions, the live leads shall be protected in accordance with SEC. 360 of this handbook.
1.11 This section covers basic information pertaining to the common wiring of Central Office equipment.	2.1022	Another exception to the requirement stated in PAR. 2.102 shall be made in the case of universal local cables where, due to variable features, common leads may be run to other than the nearest piece of apparatus to avoid splices which would be
1.111 The requirements covered in this section shall be followed except as modified by application specifications and drawings.		
1.2 <u>Verification</u>		
1.21 Items for the verification of the equipment installed by the operations covered in this section are listed under PAR. 3.		
<u>2. WIRING</u>		
2.1 <u>Common Wiring</u>		
2.101 The use of one set of common leads, such as battery and ground leads, to supply several small groups of adjacently mounted unlike circuits instead of separate sets of leads for each group is permissible, providing the number of circuits supplied by such common leads is not greater than the smallest number specified for any of the circuits served by the particular leads.		

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required in order to extend a lead along the form. An example of such an exception is the case of No. 3 Toll switchboard keyshelf cables for outward positions where the common wire is brought out of the form at a point opposite the nearest apparatus position which is equipped on all types of No. 3 Toll positions. In 550, 551 and similar type PBX switchboards, the common wire in the keyshelf form shall run to the tip of the form where the lowest numbered key is always equipped, and the loop wire shall then be run back toward the nearest piece of apparatus.

2.103 Where all the wires are not to be included in the same cable form, as in cases where switchboard cable is used in connection with local cable, the common wires shall be run to the strip or mounting plate having the nearest associated piece of apparatus or to punchings located on the equipment. Where punchings are not furnished, the common wires shall be brought out of the cable at a point opposite the nearest strip or mounting plate of apparatus and left long enough to reach the apparatus on the strip.

2.104 When the nearest piece of apparatus is adjacent to a large cable form and the common wires will cause congestion if brought out at this point, the common wires shall be brought out of the form with the regular skimmers to the next associated piece of apparatus suitable for the connection where congestion would not occur. If more than one set of common wires are required, bring them out at two points, one opposite each of the two nearer associated pieces of apparatus.

2.105 Ringing loop wires between similar pieces of equipment, such as relays, etc., on relay racks and keys in keyshelves shall not, in general, be superimposed but shall be run in the regular local cable form, except in the case of sources of ringing supply, such as 84H, and similar type interrupters having an irregular wave form, when the loop wires are segregated as "C5" wiring.

2.106 Common wires looped between adjacent terminal strips on relay rack units or bay wired equipment shall be formed as follows:

2.1061 Where there are six or more common wires, they shall be sewed into a form and connected to the local side of the terminal strip.

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2.1062 Where there are five or less common wires, they shall be superimposed on the switchboard cable form serving the terminal strips and shall be connected to the switchboard cable side of the terminal strip.

2.107 Where one set of common leads serves more than one group of multi-circuit relay rack units, the common wires, except as stated in PAR. 2.105 for those serving 84H and similar type interrupters, shall be multiplied from the first circuit of the first group at which the common wires terminate to the corresponding circuits of the other groups served by the common leads, unless otherwise specified. The common wires within a group, i.e., circuits served by one set of common leads, shall be run from the last circuit of the first unit to the first circuit of the other units in the same group (e.g., 10 to 11, 20 to 21, etc.).

2.108 Common wiring between individually mounted jacks should be run as loop leads in the forms unless otherwise specified.

2.109 Loop leads shall not be run in cable forms for the common wiring between fuse alarm lamps of vertically adjacent panels. A sleeved straight strap shall be used.

## 2.2 "C", "C1", "C2", "C4", and "C5" Wiring

2.21 The symbols "C", "C1", "C2", "C4", and "C5" are used to designate wiring which must be segregated to minimize inductive effects on other wiring. These symbols are shown at the affected leads on both the circuit schematic and the wiring diagrams, except "C1" which is shown on the wiring diagram only. The information in the following paragraphs indicates the degree of segregation required.

Note: In addition to the segregation required for "C", "C1", "C2", "C4", and "C5" wiring, there are certain rules governing the grouping of "C", "C2", or "C5" leads in one switchboard cable or in one pair, triple, or quad of wire run on cable racks. These rules are not covered in this section since they are applied by the engineer in selection of switchboard cable or wire.

2.211 "C" Wiring

2.2111 "C" wiring must be segregated from "C2" wiring and all wiring not marked on the circuit drawings when run as:

Switchboard Cable - Except the switchboard (covered or un- \* local power cable from stripped portion) DPTS to switch frames within the line-up for No. 1 and 350A Step-by-Step Offices, the switchboard cable from the ring-ing and tone equipment to the DPTS, and the switchboard cable multiple be-tween DPTS's for the No. 355A Step-by-Step Offices.

2.2112 No segregation is required on "C" wiring run as:

Local Cable  
Formed Ends of Switchboard Cable  
Loose Wire Forms - (Unless Specified on the Circuit Schematic)

Wire on Cable Racks  
Surface Wiring Within a Unit

2.2113 "C" leads may be grouped together with other leads marked "C" or "C5" in the same switchboard cable or sewed local power cable or in the same pair, triple, or quad of wire run on cable racks as determined by the engineer in selection of cable or wire (See Note in PAR. 2.21).

2.212 "C1" Wiring

2.2121 "C1" wiring (shown on wiring drawing only) is a special treatment for "C2", "C4", or "C5" wiring. Where "C2", "C4", or "C5" wiring is specified on the circuit schematic, but superimposed wiring would interfere with hinge action or other required movement of the form such as at a keyshelf form, the leads are marked "C1" on the wiring diagram. No attempt is made to mark "C1" leads on the circuit schematic.

2.2122 The same rules of segregation specified for "C2", "C4", or "C5" wiring apply to "C1" wiring. The leads marked "C1" should be taped in a separate form and located inside of the regular form.

2.213 "C2" Wiring

2.2131 "C2" wiring must be segregated from all leads marked "C", other "C2" leads (except identical "C2" leads in other identical circuits), "C4" and "C5" leads, and all other leads not marked on the circuit drawings when run as:

Local Cable  
Switchboard Cable  
Formed Ends of Switchboard Cable  
Sewed Local Power Cable

2.2132 No segregation is required on "C2" wiring run as:

Wire on Cable Racks  
Loose Wire Forms  
Surface Wiring Within a Unit

2.2133 The only "C2" leads that may be grouped together in the same switchboard cable or sewed local power cable, or in the same pair, triple, or quad of wire run on cable racks, are identical "C2" leads from other identical circuits.

2.214 "C4" Wiring

2.2141 All leads marked "C4" on the wiring drawing carry commercial power within a unit.

2.2142 "C4" wiring must be kept separate from all other wiring except on surface wired equipment.

2.2143 All "C4" leads may be grouped together.

2.215 "C5" Wiring

2.2151 "C5" wiring must be segregated from all leads marked "C2" and "C4", and all other leads not marked on the wiring drawing when run as:

Local Cable  
Switchboard Cable  
Formed Ends of Switchboard Cable  
Sewed Local Power Cable

2.2152 No segregation is required on "C5" wiring run as:

Wire on Cable Racks  
Loose Wire Forms  
Surface Wiring Within a Unit  
Loose Wire in Fanning Rings or Other Wire Retaining Devices

2.2153 All "C5" leads may be grouped together in the same switchboard cable or sewed local power cable or in the same pair, triple, or quad of wire run on cable racks. They may also be grouped together with leads marked "C" as determined by the engineer in selection of cable or wire (See Note in PAR. 2.21).

2.22 When separation of wiring in sewed cable or local cable forms is specified (either by the symbol "C2", "C4", or "C5" on the wiring drawing) the leads to be segregated should be sewn into a separate form or forms depending on the condition, and placed on the outside of the regular form near the side on which they will run off to the branch arms of the regular forms.

2.221 In keyshelves, the placing of added forms on or near the top of the original form (the part of the form nearest the apparatus) will tend to prevent damage to the wires, from the movement of the form, when the keyshelf is raised or lowered.

2.23 Where leads in the formed ends of switchboard cables terminating at "well" type terminal strips require segregation, they should be tied together where they enter the first terminal strip, but need not be further segregated.

### 2.3 "D", "D1", "D2", "D3", "D4" and "D5" Wiring

2.311 "D" wiring shall be run in the open from terminal to terminal and shall not be sewn in cable forms for electrical reasons. These wires, which are always singles, shall be run out perpendicular to the plane of the mounting plate or panel from the terminals on the shortest piece of apparatus to the plane of the apparatus terminals farthest from the panel, and then parallel or perpendicular to the edges of the mounting plate or panel in the shortest possible manner. A minimum clearance of 1/2" between any "D" wiring and adjacent grounded metal surfaces is desirable. The paths followed for "D" leads need not be identical for all like units, even though the units may bear the same equipment code designation.

### 2.32 "D1" Wiring

2.321 In some cases, the arrangement of the wiring is so critical that certain leads must be kept as short as possible. Such leads are marked "D1" on the circuit drawings. "D1" leads, which are always single wires run in the open (not sewn in the cable form), shall be run directly from terminal to terminal instead of parallel and perpendicular to the edges of the panel as for "D" wiring, the amount of slack in "D1" leads shall be kept to a minimum, consistent with the type of terminals and the apparatus arrangements encountered.

2.3211 In no case should leads between terminals be drawn so taut as to bend the terminals. Slack, up to 1/4" maximum, shall be permitted.

2.3212 Leads to apparatus having terminals of the floating or movable type such as those encountered on electron tube sockets, certain connectors and leads between apparatus on main panels and that on subpanels (whether fixed or shock mounted) shall be run with sufficient slack as not to hamper the movement for which the apparatus design provides.

2.3213 Where an intervening terminal or other apparatus part makes it necessary for "D1" leads to deviate slightly from the theoretical direct path, the use of different but otherwise equal paths to clear such interferences is satisfactory. In other words, it is not necessary that the same path be used on all panels of the same type. Wiring so critical electrically that this deviation is unsatisfactory shall be specified as "D2" wiring.

### 2.33 "D2" Wiring

2.331 It is sometimes necessary, for electrical reasons, to keep certain leads separated from each other or to keep them in a certain location with respect to other leads. In such cases the leads will be marked "D2" and the wiring arrangement will be covered on a strapping diagram or other equipment information. This information should cover whether the "D2" leads are to be kept out in the open or (if the insulation permits) dressed back against the mounting plate.

### 2.34 "D3" Wiring

→ 2.341 D3 Wiring is similar to SW1 Surface Wiring in that it is run loose and dressed near or against the mounting plate or panel, or adjacent to the plane of the mounting surface. The difference between D3 and SW1 Surface Wiring is as follows:

(a) The type and gauge of wire is not restricted to 24 gauge BW or DP type, as it is for SW1 Wiring. For D3 Wiring, the gauge and type of wire shall be specified.

(b) Pairing is not disregarded (color of pairs, triples, and quads shall be specified).

(c) General paths for groups of wires may be specified.

(d) Due to larger gauge wire being used it may not be practicable to dress the leads in the same manner as "SW1". Therefore, it is satisfactory to run the wire in a neat orderly manner. However, sufficient slack shall be available to eliminate taut wiring.

2.35 "D4" Wiring

2.351 "D4" wiring is similar to "SW1" Surface Wiring in that it is run loose and dressed near or against the mounting plate or panel, or adjacent to the plane of the mounting surface. However, "D4" wiring differs from "SW1" Surface Wiring in that the color, gauge, type of wire, and wire paths are specified by the BTL Design Engineer, and the wiring paths are controlled by a computer program.

2.36 "D5" Wiring

2.361 "D5" wiring is surface wiring which is specifically designed for a particular unit of equipment, that is, wiring which does not conform to the requirements covered by any other surface wiring symbols, complete information for this type of wiring is specified by the BTL Design Engineer on the SD or ED Drawings.

2.4 Surface Wiring

2.41 There are two main types of surface wiring, "SW1" and "D3", which by definition are run loose and dressed back from the ends of the apparatus terminals near or against the mounting plate or panel or adjacent to the plane of the mounting surface unless wiring devices or other means are provided for controlling the dress. The wiring is run in definite paths parallel and perpendicular to the edge of the mounting plate or panel as shown in FIG. 1, 3 or 4, whichever is applicable, it is not necessary to make right angle bends, but the appearance of the wiring should be neat, and sufficient slack should be provided so that the wires will not be taut. The slack, however, shall not exceed 1 1/2", except where otherwise specified.

Note: Polyvinyl Chloride (PVC) insulated wire such as BU- and BY- type is not recommended for surface wiring because of possible damage to the insulation

which might occur when this type of wire is dressed tight against the sharp edges or corners of apparatus terminals.

2.411 In "SW1" wiring distinctive colors are used for battery and ground leads, all other wiring being green. Other colors may be used occasionally for certain specific leads to facilitate manufacture, as for example where leads run from apparatus on the front of a mounting plate to apparatus on the rear. Specific system surface wiring colors used are as follows:

Step-by-Step Switches

Green - General Wiring  
Red - Ground Leads  
White - Battery Leads

Equipment Other Than Step-by-Step Switches

Green - General Wiring  
Black - Ground Leads  
Red - Battery Leads

2.412 "SW" surface wiring, which was restricted to type G wire, was formerly used on Step-by-Step switches, and to a limited extent, on other equipment units. This type of surface wire has been replaced by "SW1" surface wiring.

↳ 2.413 SW1 Surface Wiring is restricted to the use of 24 gauge BW or DP-Type Wire. SW1 is considered to be the general use type of wiring for surface wired units. When it is necessary to use other gauges or types of wire for surface wiring, "D3, D4 or D5" wiring may be used.

NOTE: BG and BW types of wire are being converted to DP-2 irradiated polyvinyl chloride (IPVC) type of wire. Refer to Section 103 of this handbook for color conversion chart.

↳ 2.414 Surface wiring should not be confused with standard strapping. Surface wiring is shown extended to a base line on the wiring diagram which is marked "D3" or "SW1". Ordinarily, complete surface wiring of mounting plates or units is not done on the job.

2.42 In general, surface wiring is run without sewing or tying, occasional ties should be used where necessary to keep the leads in place and in reasonably good formation. Wires shall be dressed back from the apparatus terminals so that they rest near or against the mounting plate or panel, or adjacent to the plane of the mounting surface. If necessary tie the wires together so that they are maintained within the boundaries of the unit to prevent pinching or hooking of wires by adjacent units during mounting or installation. The wires shall also be kept clear of unit mounting bars or corresponding mounting surfaces.

→2.421 Surface wiring (BW or DP, or similar types) may rest against metalwork or apparatus terminals, but in no case shall the wires be drawn taut around the terminals in such a manner as to cause insulation breakdown. As far as practicable, diagonally, horizontally or vertically run wiring should be located in paths directly above or below the terminals being served. Leads should be distributed throughout the available paths so as to prevent unsightly bunching or excessive pileups. The distribution of wires over the available paths of a unit need not be identical for all like units, though the units may bear the same equipment code. As far as practicable, leads shall not cover apparatus mounting screws or functional and equipment designations.

2.4211 For E, U, Y and similar type relays mounted on 1 3/4" mounting plates, it is permissible, where necessary to avoid congestion along the top or bottom edges of the unit, to run the leads in the center of the apparatus as shown in FIG. 1. Where a series of No. 26 or similar type terminal punchings are mounted in the center of the mounting plate, the leads may be run in the center of the relays adjacent to the terminals.

2.4212 For E, U and Y type relays and 224 type terminal strips and similar apparatus having two terminal levels, wiring connected to terminals in the top level may be run either above or below the top level of terminals and wiring to terminals in the bottom level, above or below the bottom level of terminals as shown in FIG. 1. However, wiring in the center of 224 or similar type terminal strips shall be dressed so as not to obstruct holes in the mounting plate through which switchboard cable leads will be carried.

2.422 Wires to wire spring relays such as AF or AG type, shall in general, follow the wiring pattern shown in FIG. 1. Divide the relay theoretically in half. In

the upper half of the relay, the wires should run along the top plane of the mounting plate, and the bottom half wiring should follow the bottom plane of the mounting plate.

2.423 On mounting plates equipped with 224 (well) or D type terminal strips, the surface wiring paths shall not obstruct the insulated hole in the mounting plate through which the switchboard cable leads will be carried later. Where wires are to be connected to apparatus mounted in a recess on a panel, the wires shall be run around the recess opening to permit access to the apparatus for maintenance purposes.

2.424 Wiring to 227 type Terminal Strips shall be run along the mounting plate to a point approximately under the corner of the fanning strip as shown in FIG. 1. From this point, the leads shall dress along the terminal strip support directly into the notch of the fanning strip. Wiring terminating at the bottom four rows of terminals shall dress over the top of the terminal strip support and wiring to the top four rows of terminals shall dress under the terminal strip support.

2.425 Where surface wiring is run to 204 Type Selectors on relay rack units, sufficient slack shall be provided in the wiring to the bank terminals to permit the removal of the selector. The slack shall be disposed of as shown in FIG. 2. The wiring to the coil terminals requires only the normal slack as these wires are unsoldered when the selector is dismounted.

2.426 Battery and ground leads shall not be buried, but shall be run at the outside of the pile-up of leads as far as practicable. Leads added by the Installer, as in the case of circuit modifications, should not bury the battery and ground leads to such an extent as to make them inaccessible for maintenance.

2.427 The length of the tone and ringing leads to the first normally open contact shall be kept as short as practicable. The length of exposure for these leads to unpaired talking leads should in no case exceed 18".

2.428 All wires shall be dressed away from vitreous enamel-type resistors and heat-dissipating potentiometers (rheostats) or other heat producing devices to avoid a possible fire hazard.

(a) Where vitreous enamel type resistors rated greater than 2 watts are provided, the clearance shall be 1/8" (min.)

(b) Film Style resistors rated greater than 2 watts shall have a clearance of 1/16" (min.)

- (c) Where heat producing resistors of 2 watts or less are provided, the clearance shall be a minimum of 1/32".

- (c) Wiring to connectors having staggered terminal arrangements shall in general follow the wiring pattern shown in FIG. 3.

2.43 Strapping on Surface-Wired Units shall be limited to connections than can be and are normally made with bare wire or extended skinner connections. All other connections shall be made as surface wiring in accordance with FIG. 1, 3 or 4 whichever is applicable. Bare wire straps are permitted only between immediately adjacent terminals on the same piece of apparatus, provided that they do not obstruct wiring or wiring paths and that clearance requirements are met.

The connector is theoretically divided in half. In the upper half of the connector the wires shall be placed between the terminals in paths that are diagonally upward to the left. In the lower half of the connector the wires shall be placed between the terminals in paths diagonally downward to the left. If all of the wiring to a connector is to be dressed along the horizontal paths below the connector terminals, the diagonal paths between all the terminals on the connector shall be diagonally downward to the left. If all the wiring is to be dressed along horizontal paths above the connector terminals, the diagonal paths between all of the terminals shall be diagonally upward to the left.

2.431 Where relays such as A-, EA- and similar types which are equipped with strapping terminals are provided, the surface wiring may be run in the center of the relays and adjacent to the mounting plate to avoid interference with the strapping.

2.44 Where optional wiring or apparatus is specified, furnish only such wiring as can be connected on both ends unless notes on the wiring drawings specify that such leads shall be provided. In the latter case, the unconnected ends shall be protected and disposed of by tying them near their ends to other wires or to the mounting plate in such a manner that they can be identified easily. Surface wiring conductors which would connect within or to partially equipped or unequipped circuits may be omitted. However, current supply leads in this category shall be omitted.

2.432 On apparatus or groups of apparatus such as keys, jacks or resistor board mountings where the points of termination are a considerable distance from the mounting plate or panel, it is sometimes impracticable to dress the wiring between the terminals back against the mounting plates. In such cases it will be satisfactory to run the wiring in the same manner as would be used for standard strapping.

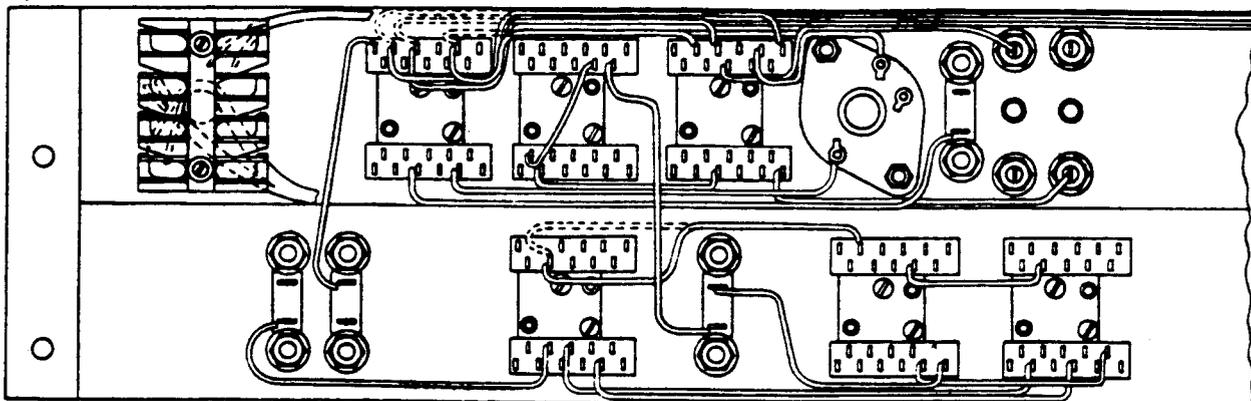
2.45 When replacing apparatus on surface wired units having soldered connections, the wire should be unwound at the terminals. If the wires are cut off, they will generally be too short to reconnect. Pulling wires taut in order to compensate for the portion cut off is liable to introduce crosses by pulling terminals together at the other end of the wire or cutting the insulation on intervening terminals.

2.433 Surface wiring for printed wiring boards and similar type connectors shall be in accordance with FIG. 3 or 4 whichever is applicable, and in accordance with the following:

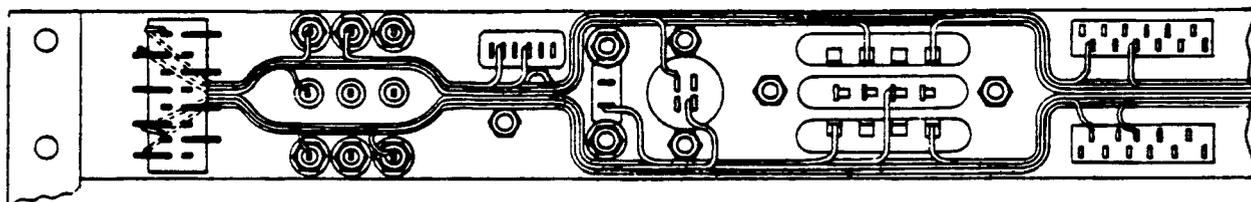
(a) Vertical wiring shall be confined to the vertical paths between connectors except at 947 Type Connectors mounted directly adjacent to each other, in which case the wiring may be dressed vertically between the connector terminals.

2.46 Where solderless wrapped connections are used for connecting surface wiring and four or more terminals are interconnected, it is desirable that the wire ends be connected so that a minimum number of wires need be disconnected when future changes are made in the grouping of terminals or when a piece of apparatus has to be replaced. This can be done as follows: Connect the first terminal to the second terminal, the third to the fourth, etc., placing the turns of wire near the base of terminals, then as a second connection on the terminal, connect the second terminal to the third, the fourth to the fifth, etc.

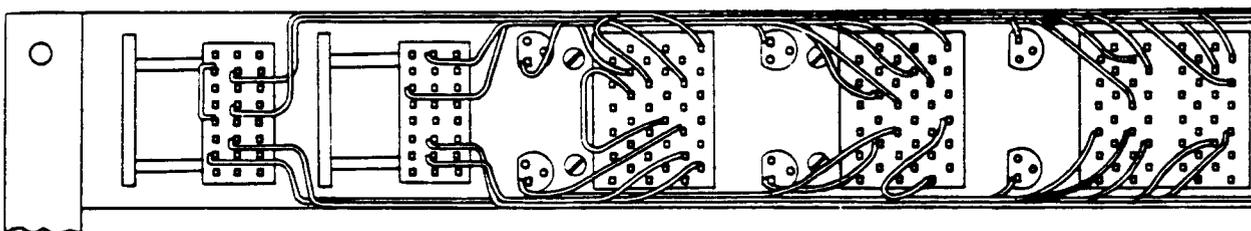
(b) On connectors with staggered terminal arrangements (FIG.3) wiring shall not be dressed horizontally between terminals except where horizontal paths 3/16" or greater in width are provided. Horizontal wiring on connectors such as the 906 through 914, 928 and similar types which are not provided with horizontal wiring paths between terminals shall be dressed along the top or bottom of the connector. Dressing of wiring between terminals where insufficient clearance is provided, especially on connectors having embossed type terminals, may result in damage to wire insulation and possible misalignment of terminals.



2" MTG PLTS



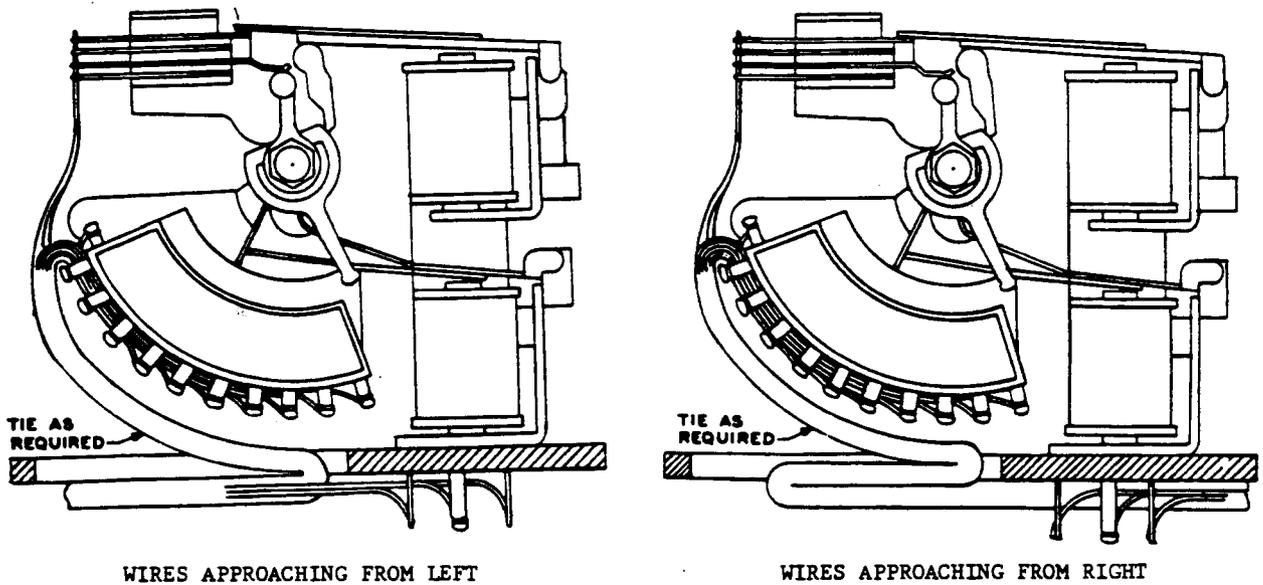
1-3/4" MTG PLTS  
FLAT TYPE TERMINALS



D-TYPE TERMINAL STRIPS AND WIRE SPRING RELAYS

RP-0082

FIG. 1 SURFACE WIRING - ARRANGEMENT OF WIRING IN PATHS  
1-3/4" AND 2" MOUNTING PLATES  
(PARS. 2.41, 2.4211, 2.4212, 2.422, 2.424, 2.43)



RP-0083

FIG. 2 SURFACE-WIRED 204- AND SIMILAR-TYPE SELECTORS MOUNTED HORIZONTALLY ON RELAY RACK UNITS (PAR. 2.425)

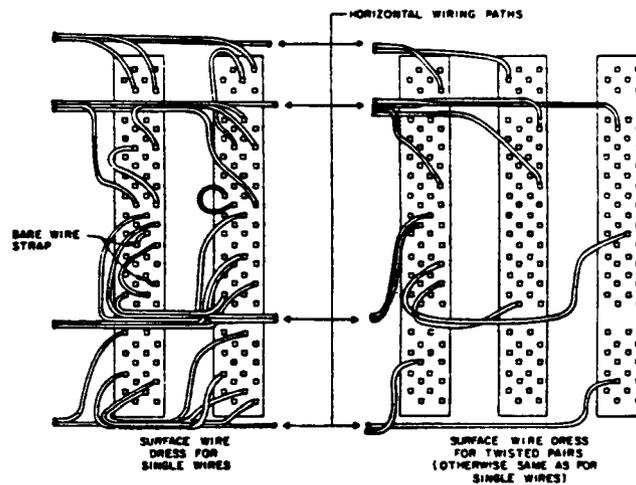


FIG. 3 SURFACE WIRE DRESS FOR CONNECTORS WITH STAGGERED TERMINAL ARRANGEMENTS SUCH AS THE 903, 905 THROUGH 914, 916, 927, 928, 940 AND SIMILAR TYPES (927-TYPE CONNECTOR SHOWN) (PARS. 2.41, 2.43, 2.433, 2.433b,c)

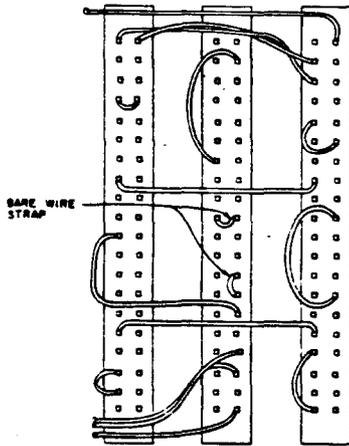


FIG. 4 SURFACE WIRE DRESS FOR CONNECTORS HAVING VERTICALLY AND HORIZONTALLY ALIGNED TERMINAL ARRANGEMENTS SUCH AS THE 924-, 925-, 926-, 947-, AND SIMILAR TYPE CONNECTORS (925-TYPE CONNECTOR SHOWN) (PARS. 2.41, 2.43, 2.433)

Note: Care should be exercised in forming miniature coaxial cable and small diameter shielded wiring to avoid drawing the cable or wire tightly on a forming board or other wiring device since excessive pressures may cause stretching or possible breakage of the conductor(s).

2.52 Shielded pairs in 750 and similar type cables shall not be stripped and formed out with other cables or wire, unless all such wire and cable conductors are insulated wires having braided PVC or Pe insulation. This applies to either sewed forms or loose wire forms. Where it is necessary to form out these pairs with wires having other than braided PVC or Pe insulation, the exposed shields shall be insulated as covered in the 700 Series Sections.

2.53 On SWI Wired Units, shielded wiring is not observed within the unit unless specifically called for by means of a note on the circuit drawing. Shielding shall be maintained, however, in leads up to the unit terminal strip.

2.5 Shielded Wiring

2.51 For treatment of shielded wire and shielded pairs in cables, refer to 700 Series Sections. The methods for terminating coaxial and twin conductor office cables are included in Handbooks 219 thru 235 as applied to the systems or equipment, respectively, covered by these handbooks.

3. VERIFICATION ITEMS

Verification Items and Brief Statement of Requirements	Reference	
	PAR. NO.	FIG. NO.
3.01 Common wires serving strip mounted apparatus should be run in the cable form to nearest strip; loop wires shall be run in form to other strips served.	2.102	
3.02 Common or loop wires should be brought out of the form at proper points.	2.101-2.104	
3.03 Ringing loop wires run between similar pieces of equipment should be run in regular local cable form except for 84H and similar ring supplies.	2.105	
3.04 Common wires looped between adjacent terminal strips on relay rack units shall be formed on the proper side of the strips.	2.106-2.1062	
3.05 Where one set of common wires serve more than one set of multi-circuit relay rack units, the wires between groups and within groups shall be run properly.	2.107	

3. VERIFICATION ITEMS (cont'd)

Verification Items and Brief Statement of Requirements	Reference	
	PAR. NO.	FIG. NO.
3.06 Common wires between individually mounted jacks should be run as loop leads in the form.	2.108	
3.07 Alarm lamps of vertically adjacent panels should be strapped together with sleeved straight strap.	2.109	
3.08 "C" leads must be segregated from "C2" wiring and all wiring not marked on circuit drawings when run as switchboard cable (covered or unstripped portion).	2.2111	
3.09 "C1" leads (specially treated "C2", "C4", and "C5" leads in keyshelves or other hinged forms and marked "C1") should be taped in a separate form and sewn inside regular form.	2.2121 2.2122	
3.10 "C2" leads should be segregated from all leads marked "C" other "C2" leads (except identical "C2" leads in identical circuits), "C4" and "C5" leads not marked on the circuit drawings when run as local, switchboard cable, formed switchboard and sewed local power cables.	2.2131	
3.11 "C4" leads shall be kept separate from all other wiring except on surface wired equipment.	2.2142	
3.12 "C5" leads must be segregated from all "C2" and "C4" marked leads when run as local, switchboard, formed switchboard, and sewed local power cables.	2.2151	
3.13 Depending on the condition, "C2", "C4" or "C5" should be sewn into a separate form on the outside of the regular form.	2.22	
3.14 Where leads in formed switchboard cables terminate at "well" type terminal strips and segregation is required, they should be tied together at first terminal strip.	2.23	
3.15 "D" leads should not be sewn in forms, but should run parallel or perpendicular to the edges of the mounting plates in the shortest possible manner and have a minimum 1/2" clearance between grounded metal surfaces.	2.311	
3.16 "D1" leads should run directly from terminal to terminal and kept as short as possible, but not taut. A 1/4" minimum slack is required with terminals unbent.	2.321 2.3211 2.3212	
3.17 "D2" leads should run in paths as specified on diagrams or other equipment information.	2.331	
3.18 Surface wires should not be drawn tight and the proper separation of terminals shall be maintained.	2.41	1,3,4
3.19 Surface wire leads should use path parallel or perpendicular to the edges of the mounting plates and dressed back against the plate, prevention of bunching and pile-ups required. Do not cover mounting screws, functional or equipment designations.	2.41 2.431 2.4213	1

3. VERIFICATION ITEMS (cont'd)

Verification Items and Brief Statement of Requirements	Reference	
	PAR. NO.	FIG. NO.
3.20 "SW1" Surface Wiring is restricted to BG or BW wire.	2.413	
3.21 Surface wires should not be banded except to keep wires in place within mounting plate edge, wire should not obstruct insulated holes.	2.42 2.423 2.424	1
3.22 Surface wiring to jacks, keys, selectors, etc., should leave sufficient slack for removal and maintenance.	2.425,243	1,2
3.23 Surface wire battery and ground leads should not be buried.	2.426	
3.24 Surface wire tone and ring leads to the first open contact should be kept short as possible. The length of exposure shall not exceed 18".	2.427	
3.25 Strapping of surface wired units should be limited to connections that can be made with bare wire or extended skinners.	2.43	
3.26 Surface wiring for printed wiring boards and similar type connectors shall be in accordance with figures.	2.433	3,4
3.27 When drawings specify leads are to be run and left unconnected, the ends must be protected and tied to other wires near their ends.	2.44	
3.28 Shielded pairs in 750 and similar type cable should not be stripped and formed out with other cables - refer to 700 Series Sections.	2.52	
3.29 On surface wired units, shielding shall be maintained up to the Units T.S.	2.53	
3.30 Clearance required between surface wiring and heat producing devices.	2.428	

→ Indicates New or Revised information

Engineering Planning Manager  
(Installation)

## Reason for Reissue:

To update information to conform to latest BSP Issue.