

**RELAY RACKS—CHANNEL TYPE
FRAMEWORK
EQUIPMENT DESIGN REQUIREMENTS
COMMON SYSTEMS**

1. GENERAL

Scope

1.01 This specification, together with the supplementary information listed herein covers the equipment design requirements for relay racks of the channel type. Equipment included in this specification may be ordered by specifying the code and group numbers covered in part 4.

1.02 Changes in requirements which have been made with this issue are explained under Reasons for Reissue at the rear of the specification.

Capacity

1.03 The mounting plate capacities of the channel relay racks, either 19" or 23" are as follows:

HEIGHT	1-3/4" MTG. PLTS.
5'-2 1/8"	31
* 6'-9"	41
7'-0"	43
8'-8"	48
* 9'-0"	50
11'-6"	68

Note: Where practicable, the bottom three mounting plate positions of the 5'-2 1/8" and 7'-0" are not to be equipped with apparatus requiring maintenance. Items marked * are available for 23" plates only.

Description

1.04 The relay racks covered by this specification are furnished in welded single bay units made with 3"—4 lb. channel uprights, and are drilled for 1 3/4" wide mounting plates.

1.05 Height: The relay racks are of fixed height of 5'-2 1/8", 6'-9", and 7'-0" for the floor supported type and 8'-8", 9'-0", and 11'-6" for the auxiliary framing supported type.

1.06 Width: Each height of relay rack is furnished in bays of two widths, 1'-8 3/8" and 2'-0 3/8" measured between the backs of the channel uprights. These widths are such that the racks will mount 19" and 23" long mounting plates respectively. Exceptions to this are the 6'-9" and 9'-0" heights available only in the 2'-0 3/8" width and the 11'-6" rack having a 1'-0" sheet metal frame base available only in the 1'-8 3/8" width.

1.07 Angle type ladder guard rails are furnished on both sides of all 8'-8", 9'-0" and 11'-6" high relay racks and on floor supported relay racks only when lined up with 8'-8", 9'-0" or 11'-6" racks or when specified for isolated lines. The guard rails for the high type racks are furnished in lengths of 1, 3, 5 and 7 bays of relay rack. The guard rails are 1'-0", 1'-3" or 1'-8" wide as required and consist of 1-1/2" x 1-1/2" x 3/16" angles supported by details bolted directly to the relay rack uprights.

1.08 Sheet Metal Frame Base: Racks 11'-6" high having sheet metal type frame base are available as follows. A 10" width of base extending 7" to the rear of the uprights is designed for use on 19" or 23" jack bays in toll offices. A 1'-0" width of base extending 5" on the front and 4" on the rear is designed for use on 19", 11'-6" bays for equipments requiring a 1'-0" width of guard rail and located in the same office with other frameworks employing sheet metal designs, such as in toll carrier offices.

1.09 End Guards: An end guard assembly is available for each end of all 8'-8", 9'-0" and 11'-6" high relay racks. The end guard assembly extends to a height of 8'-8" from the floor for

8'-8" and 9'-0" high racks and is designed to be used with the 1'-0" guard rail only. For 11'-6" racks the end guard extends to a height of 11'-5" from the floor and is furnished in three widths to be used with the 1'-0", 1'-3" and 1'-8" guard rails respectively. The cabinet type end guard used with certain 11'-6" bays extends to a height of 11'-4 1/2" from the floor and is available in 10" and 1'-0" widths corresponding to the two sheet metal base widths.

Subdivisions of Equipment

- ED-20670-01—End Guards used with 1'-3" and 1'-8" Angle Ladder Guards
- ED-25529-01—Method of Junctioning Racks with 1'-0", 1'-3", or 1'-8" Guard Rails to Racks Having 10" Wide Frame Base
- ED-90266-01—Method of Junctioning to I-Beam Relay Rack
- ED-90370-01—Relay Rack—Floor Supported Type
- ED-90672-01—Relay Rack—Auxiliary Framing Supported Type with Angle Guard Rails
- ED-90838-01—End Guards Used with 1'-0" Angle Ladder Guards
- ED-91590-01—Relay Rack—With Sheet Metal Frame Base
- ED-91659-01—End Guards—Cabinet Type

2. SUPPLEMENTARY INFORMATION

- 800-600-000—List of General Equipment Requirement Sections
- 801-000-000—Equipment Design and General Equipment Requirements and Engineering Information—Common Systems

3. DRAWINGS

- ED-20670-01—End Guards Used with 1'-3" and 1'-8" Angle Ladder Guards
- ED-25529-01—Method of Junctioning Racks Having Angle Guard Rails to Racks Having 10" Frame Base
- ED-60254-02—Supports for Covers and Terminal Strips—19" Panels
- ED-61166-01—Common Covers—19" Panels
- ED-61866-01—Dry Battery Cabinet Assembly—For 19" Relay Racks

- ED-61885-01—Method of Junctioning to Cable Duct Bays
- ED-90056-01—Mounting of 33 Type Connecting Blocks
- ED-90064-01—Fibre Faced Wood Panels—19" and 23" Lengths
- ED-90093-01—Method of Grounding
- ED-90185-01—Repeating Coil Mounting Assemblies—19" and 23" Relay Racks
- ED-90266-01—Method of Junctioning to I-Beam Relay Racks
- ED-90273-01—Adapters to Mount 19" Plates on 23" Relay Racks
- ED-90335-01—Fuse Panel Adapters and Equipment Guard
- ED-90370-01—Relay Rack—Floor Supported Type
- ED-90410-01—Key Mounting Assembly—A, B, & C Keys—19" and 23" Lengths
- ED-90414-01—Coil Guard—For 19" and 23" Relay Racks
- ED-90436-01—Portable Shelf Assemblies For Test Boxes—19" Relay Racks
- ED-90458-01—Terminal Strip Supports—Assembly
- ED-90459-01—Terminal Strip Supports—Method of Mounting
- ED-90484-01—Ground Bus Bar Connections
- ED-90507-01—Portable Writing Shelf Assembly—For 19" and 23" Relay Racks
- ED-90672-01—Relay Rack—Auxiliary Framing Supported Type—With Angle Guard Rails
- ED-90674-01—Cable Brackets and Miscellaneous Supports
- ED-90697-01—Frame Designation Sign, DPTS, Pilot Lamps and Fuse Holder Mounting Arrangement
- ED-90838-01—End Guards Used with 1'-0" Angle Ladder Guards
- ED-90929-01—Steel Panels—19" Length
- ED-90984-01—Blank Apparatus Panels—23" Length
- ED-91000-01—Universal Dry Battery Shelf Assembly—For 19" Relay Racks
- ED-91309-01—Conduit Arrangement—Commercial Service Supplying Relay Rack Mounted Equipment
- ED-91457-01—Adapters to Mount Message Register Plates—For 19" and 23" Relay Racks
- ED-91561-01—Space Required on Mounting Plates for Their Support
- ED-91590-01—Relay Rack—With Sheet Metal Frame Base

ED-91639-01—Adapters for Extending Jack Mountings,
Etc., Out from Relay Rack
ED-91659-01—End Guards—Cabinet Type

4. EQUIPMENT

ED-20670-01—End Guards Used With 1'-3" and 1'-8" Angle Ladder Guards

Group 1—End guard for either end of 11'-6" relay rack with 1'-3" angle ladder guards

Group 2—End guard for either end of 11'-6" relay rack with 1'-8" angle ladder guards

ED-25529-01—Method of Junctioning Racks with 1'-0", 1'-3" or 1'-8" Guard Rails to Racks Having 10" Wide Frame Base

Groups 1 to 4,—9 to 12, and 17 to 20—Junctions details as required between racks with 1'-10", 1'-3" or 1'-8" guard rails and frames or racks having 10" wide frame base, with varying space between frameworks being junctioned.

ED-90266-01—Method of Junctioning to I-Beam Relay Rack

Group 1—Top angle and upright junction details

Group 7—Guard Rail junction details

ED-90370-01—Relay Rack Assemblies—Floor Supported Type

Group 1—One 19" bay 5'-2 1/8" High, less guard rails

Group 2—One 23" bay 5'-2 1/8" high, less guard rails

Group 3—One 19" bay 7'-0" high, less guard rails

Group 4—One 23" bay 7'-0" high, less guard rails

Group 9—Ladder guard rails including supports for one 19" bay

Group 10—Ladder guard rails including supports for one 23" bay

Group 11—One set of end ladder guards

Group 12—One 23" bay 6'-9" high, less guard rails

ED-90672-01—Relay Rack Assemblies—Auxiliary Framing Supported Type—With Angle Guard Rails

Group 1—One 19" bay 8'-8" high, less guard rails

Group 2—One 23" bay 8'-8" high, less guard rails

Group 3—One 19" bay 11'-6" high, less guard rails

Group 4—One 23" bay 11'-6" high, less guard rails

Group 5—One 23" bay 9'-0" high, less guard rails

Group 7—Ladder guard rails for one 19" bay

Group 8—Ladder guard rails for three 19" bays

Group 9—Ladder guard rails for five 19" bays

Group 10—Ladder guard rails for seven 19" bays

Group 11—Ladder guard rails for one 23" bay

Group 12—Ladder guard rails for three 23" bays

Group 13—Ladder guard rails for five 23" bays

Group 14—Ladder guard rails for seven 23" bays

Group 19—One end support for 1'-0" guard rail

Group 20—One end support for 1'-3" guard rail

Group 21—One end support for 1'-8" guard rail

Group 22—One mid support for 1'-0" guard rail

Group 23—One mid support for 1'-3" guard rail

Group 24—One mid support for 1'-8" guard rail

ED-90838-01—End Guards Used with 1'-0" Angle Ladder Guards

Group 4—End guard for either end of 8'-8" relay rack

Group 5—End guard for either end of 11'-6" relay rack

Group 9—End guard for right end of 9'-0" relay rack

Group 10—End guard for left end of 9'-0" relay rack

ED-91590-01—Relay Rack Assemblies—With Sheet Metal Frame Base

Group 1—One 19" bay 11'-6" high with 1'-0" sheet metal frame base

Group 2—One 23" bay 11'-6" high with 10" sheet metal frame base

Group 3—One 19" bay 11'-6" high with 10" sheet metal frame base

Group 4—One 3" wide frame base filler assembly

ED-91659-01—End Guards—Cabinet Type

Group 1—End guard 1'-0" wide for 11'-6" relay rack

Group 2—End guard 10" wide for 11'-6" relay

rack
Group 3—End guard 10" wide set out 3" for 11'-6"
 relay rack

5. GENERAL NOTES

5.01 Relay racks covered herein shall be used for new installations, new lineups in existing offices, and for additions to existing lineups where the ladder guard rails will fit or can readily be adapted.

Growth of Lineup

5.02 The relay rack lineups may grow at either end.

Ladder Guard Rails

5.03 Ladder guard rails of the angle type shall be furnished on both sides of all 8'-8", 9'-0", and 11'-6" high auxiliary framing supported relay racks. They shall be provided for floor supported relay racks in all cases where these racks are lined up with racks equipped with guard rails. Where the floor supported relay racks are in isolated lineups, ladder guard rails shall be provided only where specified. Sheet metal frame bases, where provided, constitute the guard rails for these bays.

End Guards

5.04 End guards, which include end ladder guard rails, shall be furnished on both ends of each row of 8'-8", 9'-0" and 11'-6" high relay racks or isolated bay unless otherwise specified by the Telephone Company. No end guard shall be furnished on the end of a rack located a distance of 8" or less from a wall, column, or adjacent frame. No end guards are provided on floor supported relay racks, end ladder guard rails only being available for use in finishing off a lineup of racks equipped with ladder guard rails. For cases where a single intermediate bay, having angle guard rails, is not initially provided see Paragraph 5.05.

Details for Closing Space of One Unequipped Bay

5.05 Furnish a set of ladder guard rails per G7 (19") or G11 (23") and pipe details 3'-6" from floor as per ED-90672-01 for any single unequipped bay between initially equipped bays within a lineup.

Support of Relay Racks

5.06 The relay racks shall be supported in accordance with the general equipment requirements for auxiliary framing. Two floor bolts shall be used to fasten each isolated bay to the floor and one bolt per bay in lines of bays of 8'-8", 9'-0" and 11'-6" height. Two floor bolts shall be used to fasten each bay of floor supported relay rack.

Junctioning of Adjacent Bays

Channel Relay Racks

5.07 Channel uprights of adjacent bays shall be junctioned at the top and bottom only by means of bolts through the webs of the channels using the holes provided for the purpose on floor supported relay racks or the holes for end guard support details provided on the 8'-8", 9'-0" and 11'-6" racks. The uprights shall be separated at these points by a 1/8" thick spacer or spacer of thickness as near 1/8" as practicable, in the manner shown on the assembly drawings.

5.08 Angle type ladder guard rails of adjacent bays shall be junctioned in the usual manner, no other joining being required such as between floor or top angles.

Channel to I-Beam Relay Racks

5.09 When 8'-8", 9'-0" or 11'-6" high channel relay racks are located in a lineup with I-beam relay racks of the same height, the top angles, uprights and angle type ladder guard rails shall be junctioned as covered on drawing ED-90266-01.

5.10 When 8'-8", 9'-0", or 11'-6" high channel relay racks are lined up with floor type relay racks, the angle type ladder guard rails only shall be junctioned as covered on drawing ED-90266-01.

5.11 The sheet metal frame bases of adjacent bays of this type require no fastening between bays.

Angle Guard Rails to 10" Frame Base

5.12 Bays having 1'-0", 1'-3" or 1'-8" angle guard rails shall be junctioned to frames or racks having 10" frame base as shown on ED-25529-01.

Frame Base Filler

5.13 Where bays having 10" wide sheet metal frame bases are employed as jack bays, the cable pile-up may be very large and extend beyond the upright. A 3" wide frame base filler is required in this case on the left end, facing the rear, of the end bay to protect and separate the cable from the end guard or adjacent bay of other type equipment. Adjacent jack bays of this type generally have the equipment so arranged as to accommodate the cabling to the adjoining bay without requiring this 3" separation.

Relay Rack Coil Guard

5.14 A relay rack coil guard per guard drawing listed herein shall be provided in front and in back of all double side mounted coils on relay racks when specified by the Telephone Company.

Fuse Panel Adapters and Equipment Guard

5.15 Slotted steel plate adapters shall be furnished as required for mounting standard 40 and 60 capacity double row fuse panels on relay racks drilled for 19" and 23" mounting plates respectively.

5.16 If an entire bay of relay rack is equipped with fuse panels, an equipment guard consisting of a 3/4" half round bar shall be mounted across the front of a panel located approximately 4'-3" from the floor and insulated from the framework as covered on the drawing showing the equipment guard details. The fastening screws that support the panel shall be used to hold the equipment guard.

Cable Brackets

Switchboard

5.17 Two types of switchboard cable brackets are available as shown on the cable bracket drawing, namely, the spring or clip type and the "L" type. The spring type is generally employed due to its ability to be clipped to the upright at any height, the "L" type being used where bracket locations can be at fixed points.

Local

5.18 The "T" type bracket shown on the cable bracket assembly drawing is screwed on at

fixed points and is used to support local cables, or the local forms can be supported from the spring type brackets when provided.

Cable Drop Supports

5.19 A bar steel cable support as shown on the cable bracket drawing should be furnished when required for each 8'-8", 9'-0" and 11'-6" high relay rack for supporting cable drops from overhead cable racks to terminal strips mounted at the top of the bays. The support mounts on the rear of the uprights near the top of the bay.

Interbay Cable Supports

5.20 Bar steel interbay cable supports shown on the cable bracket drawing should be furnished when required for supporting local cables and power wires running between adjacent bays.

Cable Racks—Floor Supported Relay Racks

5.21 Cabling to equipment mounted on floor supported relay racks may be carried on cable racks mounted at the top of the bay or on the rear at the bottom as shown on the relay rack assembly drawing. In general the lower cable rack shall be located 8-1/2" from the floor measured to the top of the cable rack, but the relay rack is drilled to permit locating the cable rack 7-1/4" from the floor to accommodate a larger amount of cabling. The cable rack cannot be located in the lower position when ladder guard rails are furnished.

Grounding

Frame Ground

5.22 Relay rack bays requiring only a framework ground, shall be grounded by means of a No. 6 cable per KS-5482 terminated in a lug located on the inner side of an upright near the approximate center of the ultimate lineup.

Combination Frame and Circuit Ground

5.23 Where a circuit ground is required in addition to the regular framework ground a ground bus bar shall be furnished. A 1" x 1/4" ground bar available for this purpose will in general be of sufficient capacity for the calculated supply lead feeding these bars. The unit ground bars in a lineup shall be joined together as shown on the

ground bus bar connection drawing and the supply lead terminated at a convenient point in the lineup. Where bus bars are so provided the framework is grounded by contact between the bus bar and the relay rack uprights.

5.24 On auxiliary framing supported relay racks on the bus bar shall in general, be located in the front and near the top of the bay under the terminal strip support assemblies when provided.

5.25 On floor supported relay racks, the bus bar shall in general, be located on the rear of the frame just above the cable rack. To avoid interference with the cabling in case of a large cable pileup, the cable rack may be installed in its lower position and the bus bar mounted on the front of the frame. In this case the installer shall drill the framework for the bus bar as required.

REASONS FOR REISSUE

1. To include requirements for channel relay racks having sheet metal type base construction and associated cabinet type end guards.

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2. To cover requirements for junctioning to cable duct frameworks and crossbar type frames and racks.
3. To cover details for closing and unequipped space of a bay of relay rack per ED-90672-01.
4. To remove reference to drawing ED-90405-01 covering assembly of a relay rack mounted cross-connection rack and drawing ED-60664-01 covering Mfr Disc. terminal strip and aisle pilot mounting on end guards.
5. To list drawing covering space required on mounting plates for their support.
6. To list drawing covering adapters for extending jack mountings, etc. out from a relay rack.
7. To list drawing covering blank apparatus panels.
8. To list latest drawing covering dry battery cabinet mountings.