

**Recommended Design Criteria and Functional/Operating Guidelines for a  
Position-Light Signal**  
Revised 2023 (4 Pages)

**A. Purpose**

This Manual Part recommends design criteria and functional/operating guidelines for a position-light signal

**B. Additional Recommendations for More Information on Design and Material**

See Manual Part 7.5.1 Identical Items "Boilerplate" for all Manual Parts in Section 7, Sections C and D.

**C. High Signal**

1. High signal should be a combination of light units, the main and auxiliary groups of which should have the units located on an 18 in (457 mm) radius about a central unit.
2. Light units shall be mounted in such a manner as to provide the required aspects and be adjusted individually for proper alignment.

**D. High Signal Backgrounds**

1. Main group of units should be provided with a background designed to provide for the maximum number of units. Unused spaces for units shall be covered with a suitable plate which may be readily removed.
2. Background for auxiliary group of light units shall be provided.

**E. High Signal Light Units**

Light units shall be of such design and construction so as to avoid phantom aspects. Where a reflector is used, this may be accomplished by one or more of the following:

1. Provision of an inclined roundel.
2. Provision of a phankill device.
3. Provision of a conical outer lens
4. Provision of a long hood and baffle.

**F. Terminal Box for High Signals**

1. Each group of light units should be provided with a weather-tight terminal box.
2. Wires from light units should be brought to terminals in the terminal box. A wiring diagram may be located in a conspicuous place in the box.

**G. Dwarf Signal**

1. Dwarf signal should be provided with the appropriate number of lamp compartments.
2. Lamp compartments shall be separated by lightproof barriers.
3. Dwarf signal shall be so arranged as to provide the required aspects. Unused spaces shall be covered with suitable plates which may be readily removed.
4. Terminals should be provided and so located as to be easily accessible.

**H. Backgrounds and Hoods**

1. The outer edges of backgrounds for high signals shall not come closer than 8 in (203 mm) to the center of a light unit.
2. Hoods for high signals shall be not less than 10 in (254 mm) long.
3. Hoods for dwarf signals shall be not less than 5 in (127 mm) long.

**I. Lenses and Roundels**

1. Lenses and roundels for high signals should be 5-3/8 in (136 mm) in diameter of the doublet type, outer lens clear 5-3/8 in (136 mm) diameter. Inner lens colored as required 2-3/4 in (69.9 mm) diameter. Focal length of the lens combination to be 3/8 in (9.52 mm).
2. Lenses for dwarf signals should be 4 in (102 mm) in diameter, standard optical clear, 2-1/4 in (57 mm) focal length, behind which is mounted a 4 in (102 mm) diameter, 20° clear, flat, spread light roundel.
3. The outer lens shall be used with a 20° flat spread light roundel or a convex clear roundel. Roundels shall be treated for proper light diffusion on the inside surface (lens side of roundels).

**J. Roundels for High Signals**

Each light unit for a high signal shall have a 5-3/8 in (136 mm) diameter roundel of such shape as to minimize undesirable reflection of external light and a light yellow tint having nominal color coordinates of  $x = 0.53$  and  $y = 0.46$  when plotted on the chromaticity diagram of Manual Part 7.1.10 Recommended Design Criteria and Functional/Operating Guidelines for Signal Roundels, Lenses, Discs and Cones, Figure 7110A-2.

**K. Mounting**

Group mounting of light units should be adjustable with means provided to establish easily and accurately a correct alignment with the track.

**L. Binding Posts**

1. Binding posts, nuts, and washers shall conform to Manual Part 14.1.11 Recommended Design Criteria for Binding Posts, Nuts & Washers, Details & Assemblies.
2. Binding posts shall conform to Manual Part 14.1.12 Recommended Design Criteria for Standard Binding Posts.
3. Binding posts shall be mounted so they cannot be turned in the base of frame to which applied. They shall be properly insulated from each other and other metallic parts.
4. Terminal Blocks and Connectors shall conform to Manual Part 14.1.2 Recommended Design Criteria and Functional/Operating Guidelines for Solderless Screw-Clamp or Screwless Cage-Clamp Terminal Blocks Used in Wiring Signal Apparatus with Copper Wire Only.

**M. Dielectric Requirements**

1. See Manual Part 11.5.1 Recommended Environmental Requirements for Electrical and Electronic Railroad Signal System Equipment, Class B.
2. Lamp receptacle shall withstand for one minute an insulation test of 800 volts ac.
3. A surface leakage distance of not less than 1/4 in (6.35 mm) shall be provided between any exposed metallic part of the apparatus carrying current and any other metallic part hereof.

**N. Painting**

See Manual Part 7.5.1 Identical Items "Boilerplate" for all Manual Parts in Section 7, Section L.

Draft Not Yet Approved