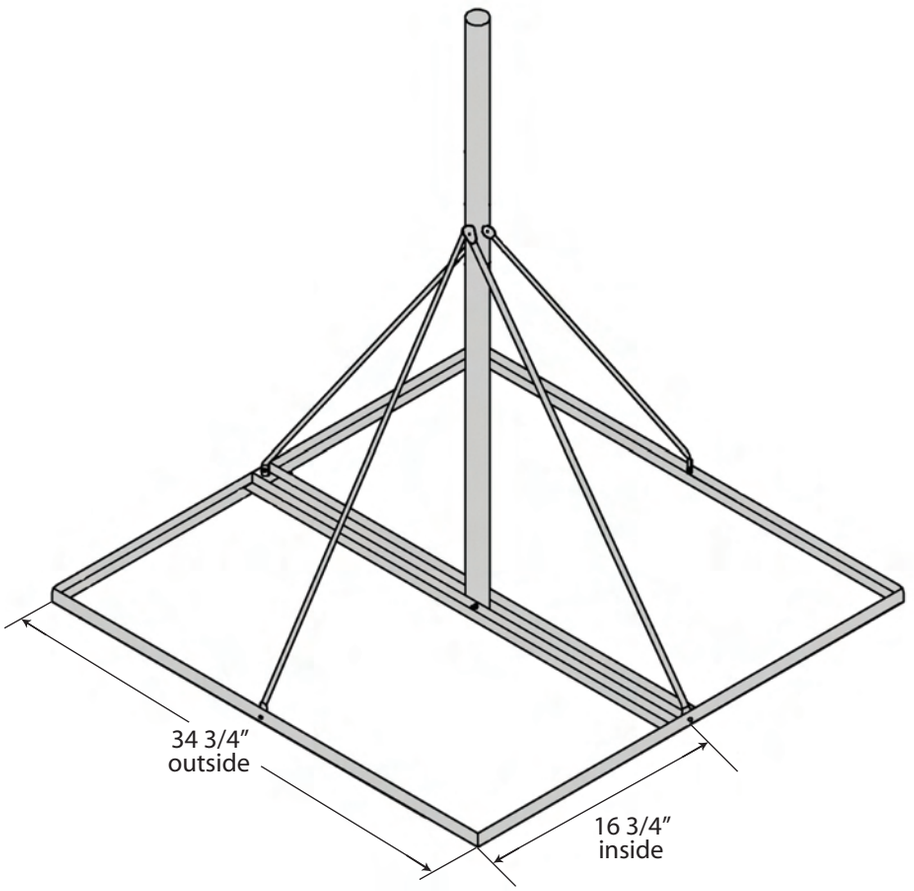
# FRM

The FRM is a non-penetrating, ballast type roof mount that offers a 30" to 60" mast in sizes ranging from 1-1/4" to 2-3/8" O.D. The base of mount is 34-3/4" square with trays to fit the concrete blocks, typically used as ballast. The mount is galvanized for corrosion protection and goes together quickly. The mount is easily shipped via UPS.




## MAST SPECIFICATIONS

| Mount Part No. | Mast Part No. | Description |
|---|---|---|
| FRM125 | FY202 | Tube 1-1/4" x 16 GA. x 60" (PG) |
| FRM150 | FY203 | Tube 1-1/2" x 16 GA. x 30" (PG) |
| FRM166 | FY204 | Tube 1.66" x 16 GA. x 30" (PG) |
| FRM238 | FY205 | Tube 2-3/8" x 14 GA. x 30" (PG) |
| FRM225 | FY205SP | Tube 2-1/4"x 14 GA. x 60" (PG) |
| FRM238SP5 | FY205SP | Pipe 2"x SCH40 x 60" (HDG) |

NOTE: The velocities in ( ) apply to the FRM125 mount when strength of the FRM125 mast governs. All other velocities are governed by overturning and apply to all FRM mounts.

## FRM ALLOWABLE ANTENNA AREAS

| Effective Projected Area (EPA) ($FT^2$) | Ballast (LBS) | Zero Velocity Load (PSF) | **(Sliding)** Vs (MPH) | Vmax at centroid of projected area, (MPH) **(Overturning)** | | | |
|---|---|---|---|---|---|---|---|
| | | | | h=2 FT | h=3 FT | h=4 FT | h=5 FT |
| 2 | 100 | 12 | 140 | 135 | 110 | 96 | 85 |
| | 200 | 24 | 198 | 188 | 153 | 133 | 119 |
| | 300 | 36 | 242 | 222 | 182 | 157 (154) | 141 (131) |
| | 400 | 48 | 280 | 269 | 219 (197) | 190 | 170 |
| 4 | 100 | 12 | 99 | 96 | 78 | 68 | 60 |
| | 200 | 24 | 140 | 133 | 108 | 94 | 84 |
| | 300 | 36 | 171 | 157 | 129 | 111 | 99 (93) |
| | 400 | 48 | 198 | 190 | 155 (139) | 134(109) | 120 |
| 6 | 100 | 12 | 81 | 78 | 64 | 55 | 49 |
| | 200 | 24 | 114 | 108 | 88 | 77 | 68 |
| | 300 | 36 | 140 | 128 | 105 | 91 (89) | 81 (76) |
| | 400 | 48 | 161 | 155 | 127 (114) | 110 | 98 |

**H** = Distance from support surface to centroid of EPA.
**Vs** = Effective wind velocity resulting in sliding on a flat surface with a .50 coefficient of friction.
**Vm** = Effective wind velocity based on strength or overturning.

# BALLAST REQUIREMENTS FOR ROOF MOUNTS

1. Ballast requirements are provided to assist consumers in determining the applicability of a non-penetrating roof mount for an antenna installation and to assist in determining the amount of ballast required. The ballast requirements should not be relied upon without competent local professional examination and verification of its accuracy and suitability for a specific site or application.
2. Specific antennas and/or other mounting configurations may require more stringent strength and ballast requirements and must be investigated for each installation. The load carrying requirements of the supporting surface, the mount and mast, the antenna and the antenna's connection to the mast must be investigated for each installation.
3. When antenna areas are indicated vs. specific antenna types, the areas tabulated are effective projected areas that include appropriate wind drag factors applied to the projected areas of the supported antennas and the exposed portions of the mount and ballast. The center of the effective projected area is assumed to be at the top of the mounting pipe or the height indicated in the ballast table. Unless otherwise indicated, tabulated ballast requirements assume that the effective projected areas are concentric to the mount and that uplift or download wind forces are insignificant.
4. The tabulated wind velocities are considered to occur at the centroid of the effective projected areas. The wind velocity appropriate for an installation must be determined on an individual site basis considering the location and elevation of the mount. The wind velocity at ground level must be multiplied by appropriate height escalation and gust factors. Potential increases in wind velocity due to channeling, roof projections, and other obstructions, must also be considered when determining ballast requirements.
5. The ballast weights indicated are assumed to be uniformly distributed on the mount. The weight of the mount and antenna may be considered as ballast. Mounts are assumed to be mounted on a flat supporting surface.
6. The zero velocity loads shown are equal to the tabulated ballast weights divided by the total area enclosed by the perimeter of the mount. This area is greater than the ballast contact area. Loads which must be investigated include reactions caused by wind forces and moments, live loads, ice loads, earthquake loads and the dead loads of ballast, mount, antenna, mounting hardware, miscellaneous equipment and roof pads.
7. The tabulated maximum wind velocities (Vmax) are based on a minimum 1.5 factor of safety against structural failure and overturning.
8. The tabulated wind velocities resulting in sliding (Vs) are based on a factor of safety equal to 1.0 and an effective coefficient of friction equal to 0.50 between the mount and a flat supporting surface. A 1.0 factor of safety was used assuming that at higher wind velocities, safety cables or other suitable attachments to the support structure would prevent sliding beyond a safe, designated area.
9. The appropriate coefficient of friction and factor of safety to determine wind velocities resulting in sliding must be determined on an individual site basis. The coefficient of friction may vary under changing moisture and temperature conditions. The minimum coefficient of friction must be used to evaluate sliding resistance. Wind speeds resulting in sliding for other factors of safety or for other coefficients of friction may be found by multiplying the tabulated values of Vs by the following modification factor:

   Modification Factor = [μ /(.5 x FS)]1/2
   μ= Coefficient of Friction
   FS = Factor of Safety

10. The values of Vs indicated do not apply for installations which are prevented from sliding by cables or other suitable attachments to the supporting structure.
11. Roof pads are recommended to prevent damage to roof membranes. Pads should be placed under all contact areas.
12. ROHN recommends that ballast material always be placed prior to mounting the antenna and that roof pads and mount be secured to prevent hazards from occurring under extreme wind loading conditions. Precautions should also be taken to prevent the inadvertent removal of ballast material after installation and to insure that all ballast material is fully supported by the mount (required for ballast to be effective in resisting overturning and sliding).
13. When adhesives are used to secure roof pads, the adhesive must be compatible with the supporting surface. Precautions should be taken to insure that damage to the supporting surface will not occur upon wind loading.
14. The installation, roof material and supporting structure must be capable of withstanding all loads imposed by the antenna system. Supporting surfaces, anchors and/or safety cables must be sufficient to resist the reactions from the antenna system. The installation must meet all applicable local, state and federal requirements.