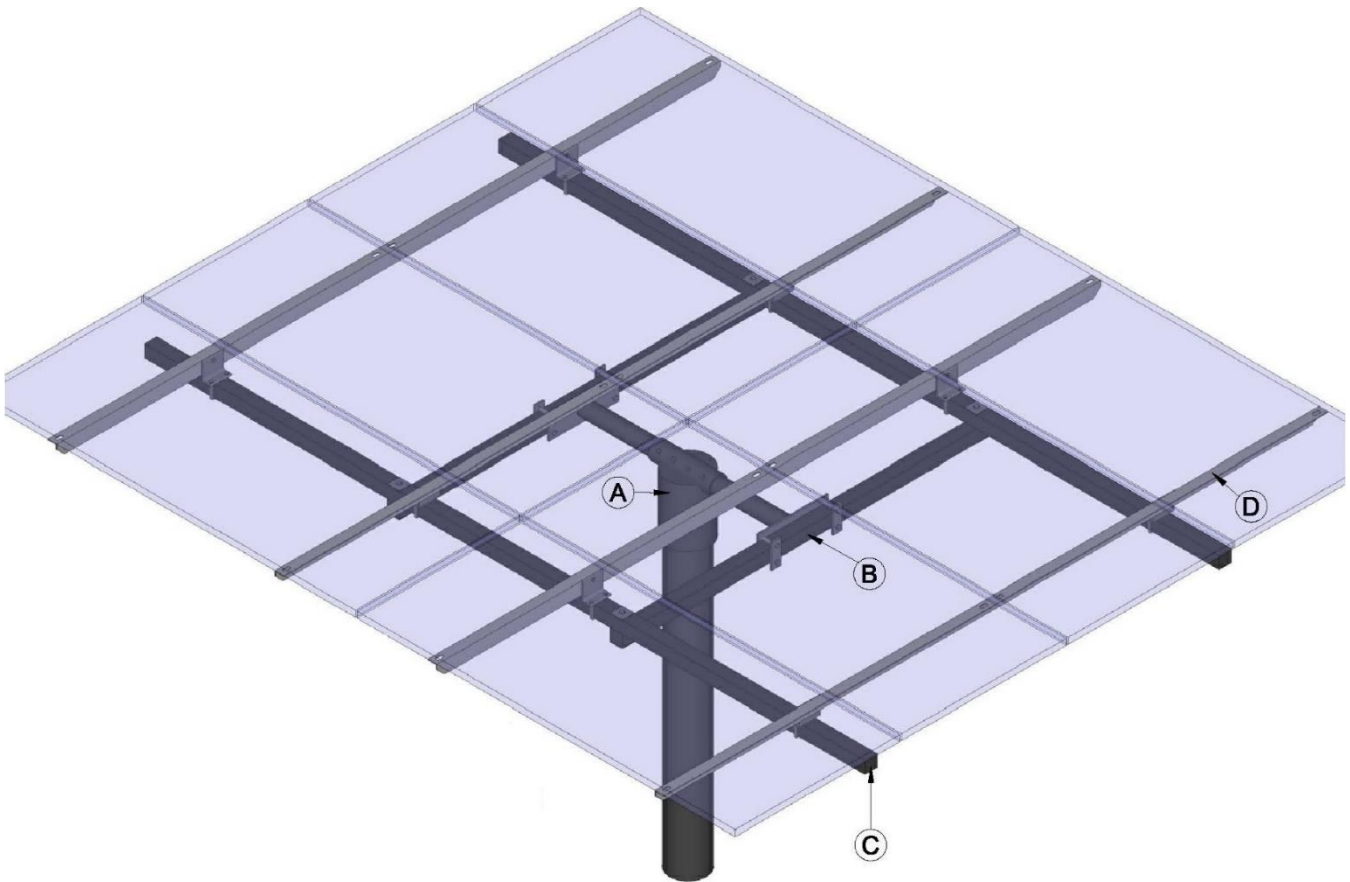


## UPM 10X and 10XHD



- A. TEE SOCKET: 7" O.D. PIPE SOCKET TO FIT OVER 6" SCHEDULE 40 OR 80 STEEL PIPE
- B. CROSS PIECE: 3" X 3" X 3/16", LENGTH IS 60" (10X) or 78" (10XHD), SQ. TUBE – 2 PLACES
- C. LONGITUDINAL: 3" X 2" X 1/8" (10X) or 3" X 2" X 3/16" (10XHD), LENGTH DEPENDENT ON MODULES USED, SQ. TUBE – 2 PLACES
- D. ALUMINUM RAILS: PUNCHED ALUMINUM ANGLE, 3" X 1-1/2" X 3/16", LENGTH DEPENDENT ON MODULE USED – 4 PLACES

**Note:** Number of panels may vary.

<b>UPM 10X and 10XHD</b>		
Standard stock Tee socket sized for 6" schedule 40 or 80 Pipe		
		REVISION:
		05.01.15

## **Materials**

**Box #1:**

- Tee with Center tube, hardware & instructions

**Box #2:**

- Crosspiece (1 of 2)

**Box #3**

- Crosspiece (2 of 2)

**Box #4:**

- Longitudinal (1 of 2)

**Box #5**

- Longitudinal (2 of 2)

**Box #6**

- Rails (4)

### **Hardware Packets in Box #1:**

**Bag #1:**

- Bolts for aluminum angle brackets (bag 6) to rails.
- Square head set bolts for Tee.

**Bag #2:**

- Bolts and nuts for crosspieces to longitudinals (use included galvy square washers in bag 6 with these).

**Bag #3:**

- U-bolts for aluminum angle brackets to longitudinals (use included aluminum angle brackets in bag 6 with these).

**Bag #4:**

- U-bolts for center tube end plates on Tee assembly to crosspieces.

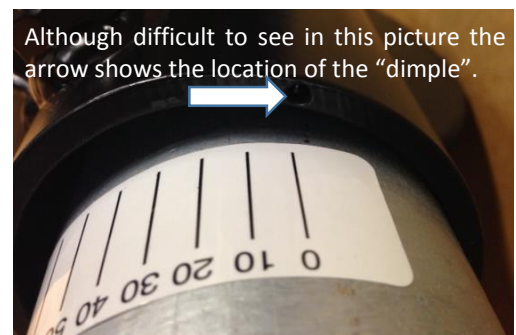
**Bag #5:**

- Instructions.
- Stainless bolts and nuts for panels to aluminum rails.

**Bag #6:**

- Galvy square washers for crosspieces to longitudinals (use with bag 2).
- Aluminum angle brackets for longitudinals to rails (to use with bags 1 & 3).

**Degree Indicator:** A degree indicator sticker has been placed on the center tube and a dimple in the tee socket is where the line on the sticker should be pointed to establish the degree of tilt from horizontal for the array that you desire. This indicator is not 100% exact (due to printing differences and placement of the sticker) but will provide an estimate of the degree of incline for you. We hope that you appreciate this feature and that it makes adjusting your array easier.



## **Recommendations for Dimensions of Post Hole for Standard Installation of General Specialties Manufacturing Top of Pole Mounts**

<b>UPM Model</b>	<b>Depth of Hole</b>	<b>Width of Square Hole / Cubic Yards of concrete needed</b>	<b>Diameter of Round Hole / Cubic Yards of concrete needed</b>
All 10X	68"	36" / 1.88 CY	45" / 2.31 CY
All 10XHD	80"	40" / 2.74 CY	50" / 3.36 CY

Your building department may require the foundation for a PV array post mount to be designed by a structural engineer licensed in the state where the PV array is to be erected. This is required because failure of a post mount foundation may be a threat to the safety of people and property in its proximity. At a minimum, failure will result in costly damage to the PV modules. The foundation described here is suitable for most soil types, but no warranty of its suitability for your particular soil or wind conditions is offered or implied.

If you are unable to dig holes of these dimensions because you encounter bed rock or if you have very loamy or loose sandy soil, (get the recommendation of a soil engineer or building department), then you may have to seek a design for an alternative foundation construction.

For type and size of pole to install in concrete foundation, refer to chart below.

## **General Specialties Recommendations for Pole Height and Dimension for Top of Pole Mounts**

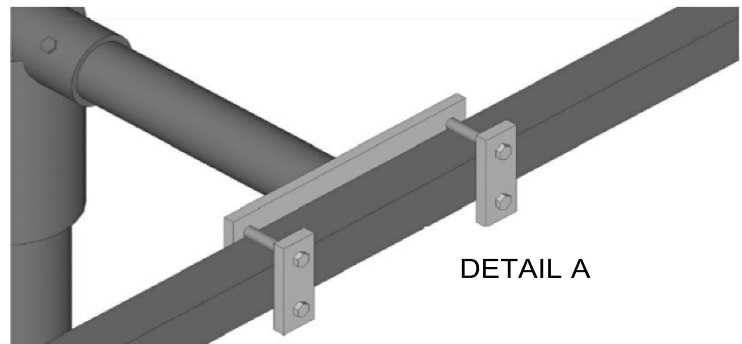
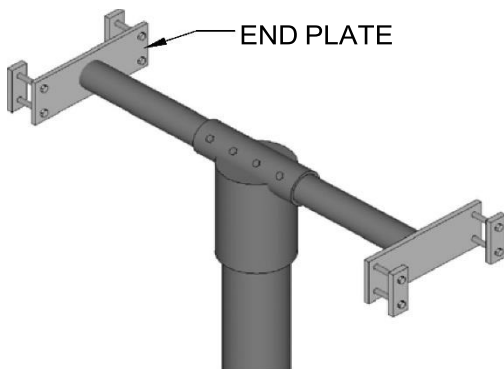
We cannot guarantee a standard 1.67 safety factor if these recommendations are not observed. Since we cannot assess each customer's individual site and conditions, a professional installer and the local building department should be consulted for the safest and most effective installation.

<b>UPM Model</b>	<b>Post Size (sch = schedule, or thickness of pipe wall)</b>	<b>Max Pole Height above concrete Base w/array @ 45° tilt</b>	<b>Clearance between top of concrete and lowest point on array @ 45° tilt</b>	<b>Max Pole Height above concrete base w/array @ 60° tilt</b>	<b>Clearance between top of concrete and lowest point on array @ 60° tilt</b>	<b>Max Pole Height above concrete base w/array @ 90° tilt</b>	<b>Clearance between top of concrete and lowest point on array @ 90° tilt</b>
<b>UPM10X</b> Standard stock tee socket size 6"	6" sch 40 6 5/8" OD	7' 9"	4' 9"	6' 3"	2' 6"	See Footnote 1	See Footnote 1
	6" sch 80 6 5/8" OD	11' 6"	8' 6"	9' 3"	5' 6"	8'	2' 8"
<b>UPM10XHD</b> Standard stock tee socket size 6", optional upgrade to 8" available	6" sch 40 6 5/8" OD	6'	1' 9"	See Footnote 1	See Footnote 1	See Footnote 1	See Footnote 1
	6" sch 80 6 5/8" OD	8' 9"	4' 6"	7'	1' 8"		
	8" sch 40 8 5/8" OD	12' 3"	8'	9' 9"	4' 5"	8' 6"	2' 1"
	8" sch 80 8 5/8" OD	17' 9"	13' 6"	14' 6"	9' 2"	12' 6"	6' 1"

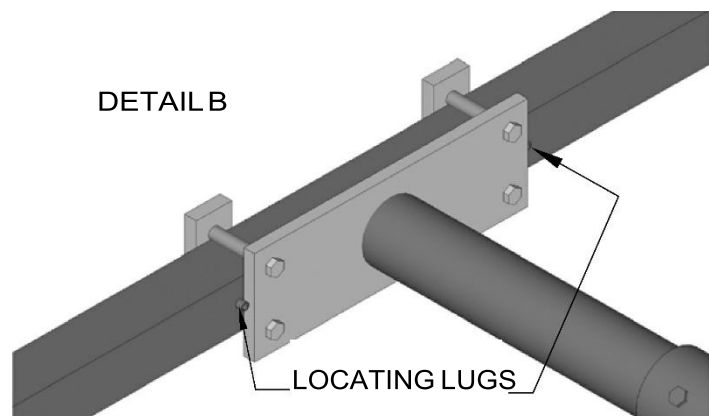
**Footnote 1:** There is not adequate clearance for these arrays with this size pipe. Use heavier schedule pipe or larger pipe diameter.

## General Installation Instructions

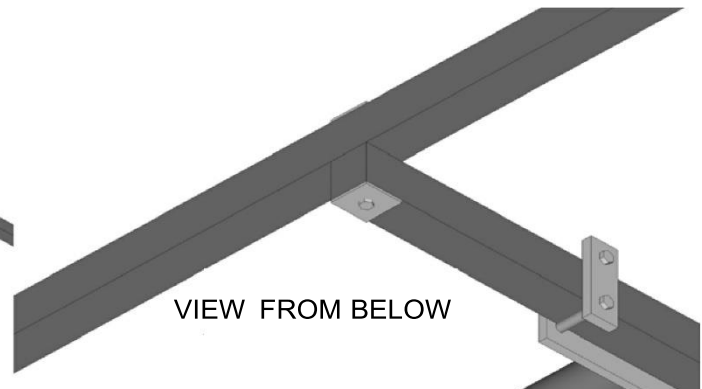
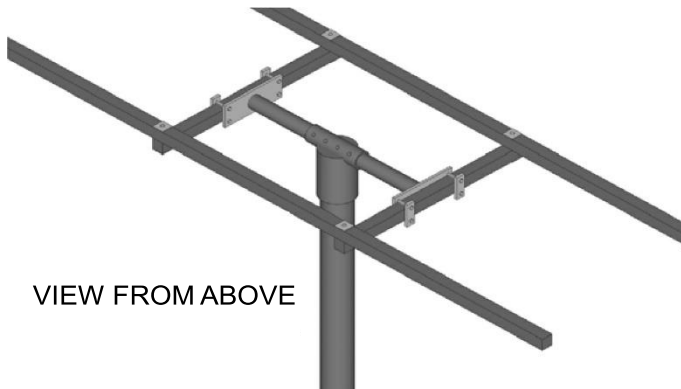
Standard stock tee socket sized for 6" schedule 40 or 80 pipe.



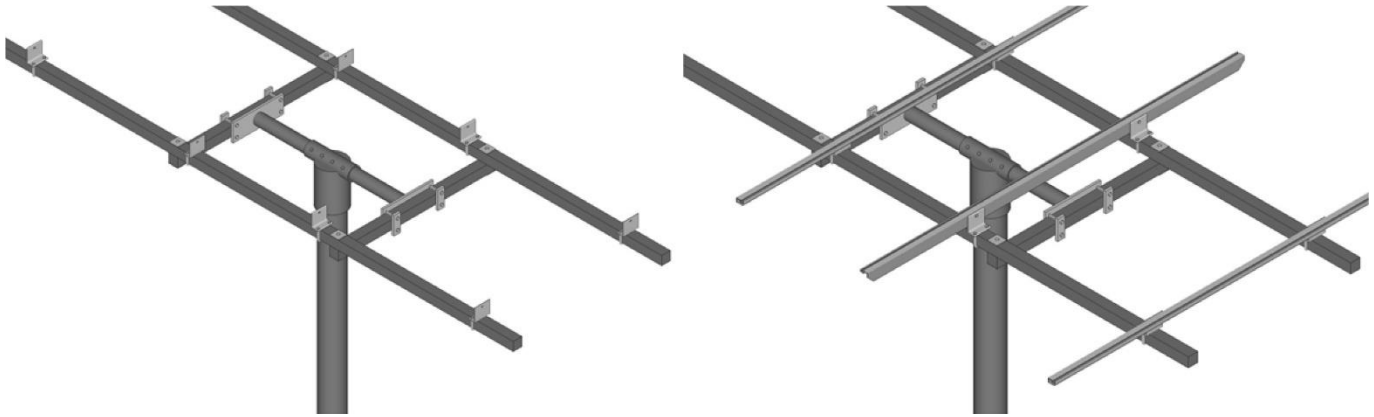
Finger tighten onto "Tee" end plates, either the U-Bolts or aluminum flat bar and straight 1/2" bolts, whichever come with your mount. Place entire "Tee" assembly on top of post. The aluminum flat bar and straight 1/2" bolts are shown in Detail "A".



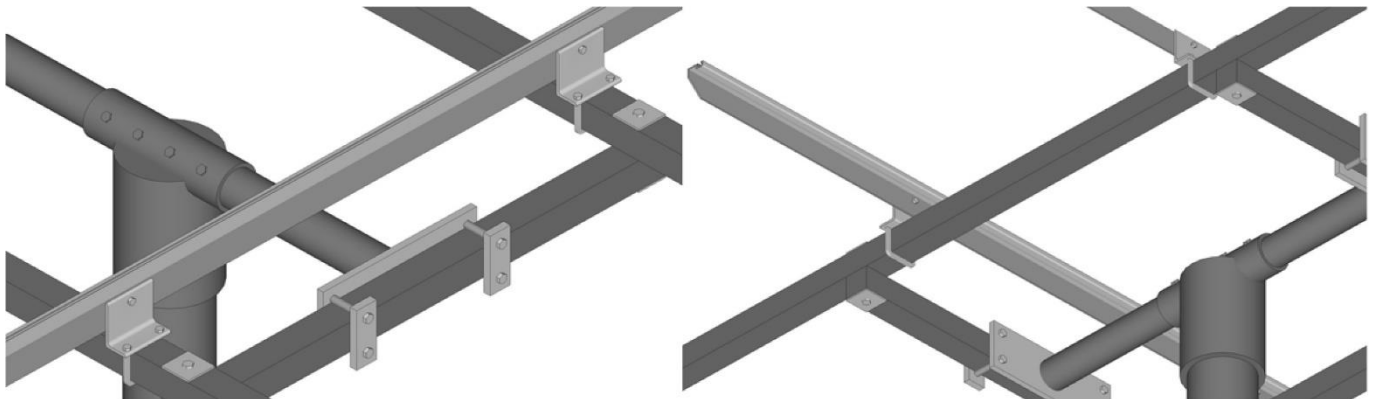
Slide cross pieces into U-Bolts or bolt and flat bar arrangement. Make sure locating lugs on cross pieces are facing in. See Detail "B" of locating lugs.



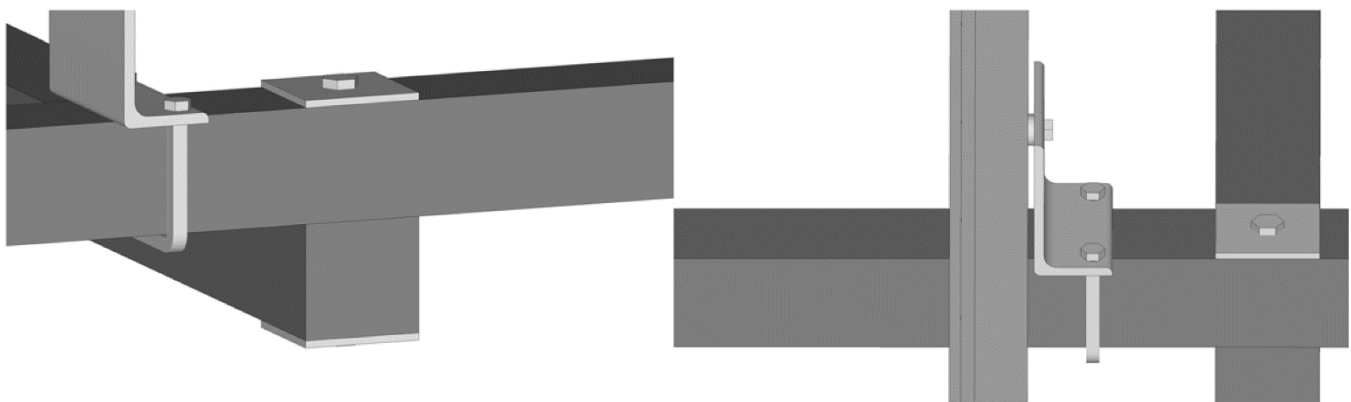
Place longitudinal tubes on top of cross pieces and bolt with square washers top and bottom.



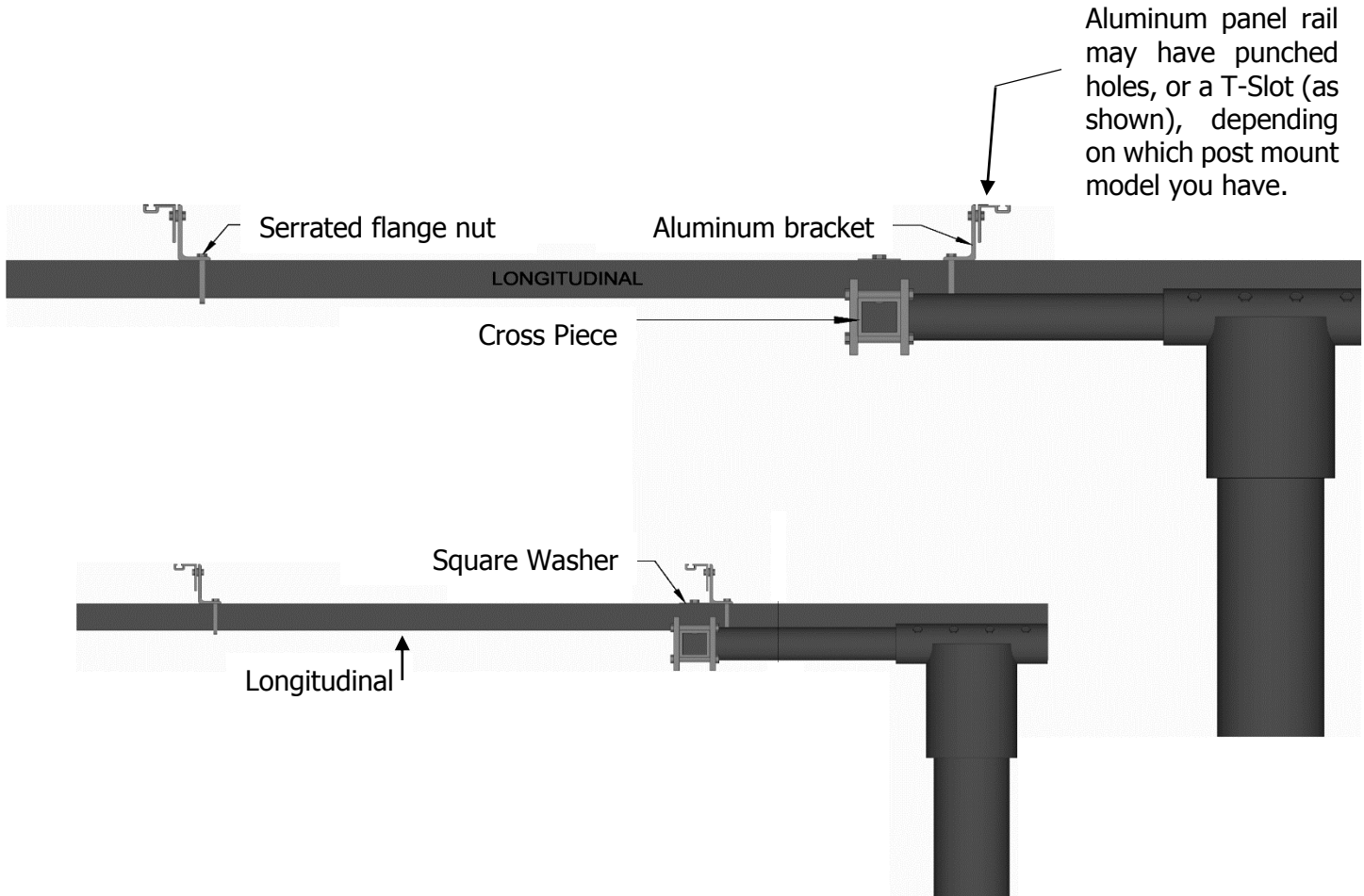
Attach aluminum angle brackets to longitudinals with smaller square U-Bolts and whiz flange nuts. Oppose aluminum angle brackets as shown. Some mounts come with aluminum angle with punched holes for bolting on panels, and some come with aluminum extrusions which allow for panel attachment bolts or clips to slide in the "t-slot".



Attach aluminum rails as shown. If rail ends are marked "TOP", align them to the same end.



**General view of assembly.** When fastening panels to rails, place first panels at end of rails marked "TOP" and work down until all panels are in place with bolts finger tight. Cross measure array for square, check to see that all spaces (approx.  $\frac{1}{4}$ " ) between panels are equal, then tighten all bolts.



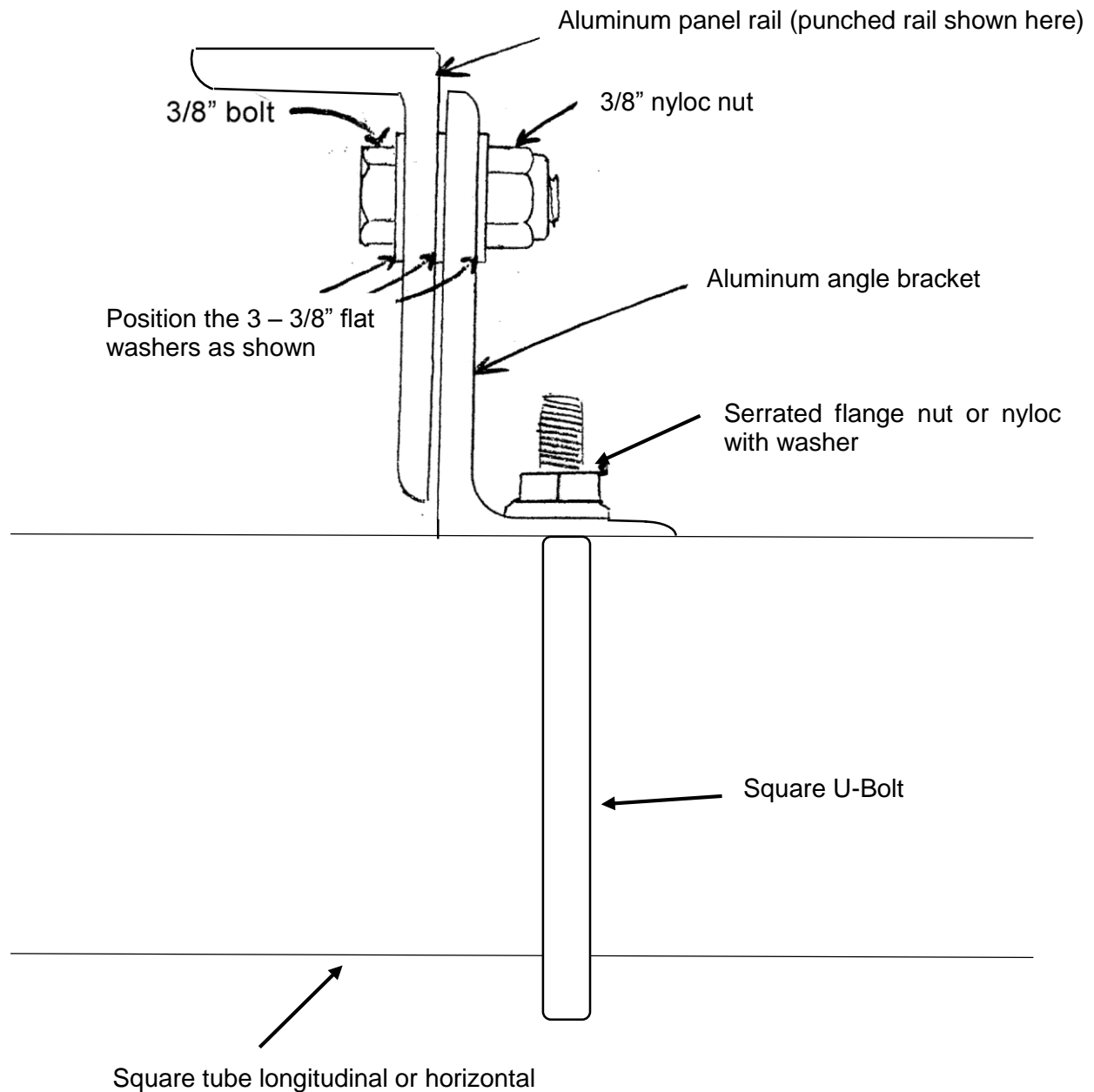
Bracket orientation in most installations is generally opposed to one another as in top picture. It may be necessary to have brackets facing in same direction as in bottom picture, if panel size is such that you need to do this to maintain a  $\frac{1}{4}$ " gap between panel ends on centerline.

**NOTE:** Leave  $\frac{5}{16}$ " serrated flange nuts *slightly loose* until all panels are attached and square to one another. **Then** finish tightening the nuts.

UPM 10X and 10XHD RAIL BRACKET LOCATION INSTRUCTIONS
REVISION:
06.24.13

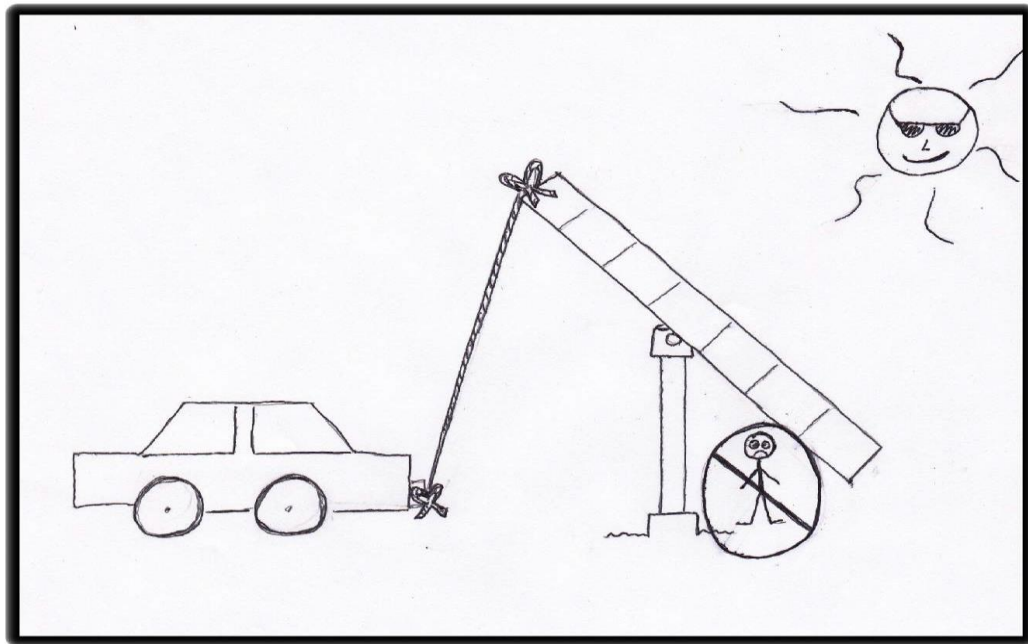


Detail of aluminum panel rail to angle bracket assembly showing arrangement of the flat washers between the bolt head, rail, bracket, and nyloc nut.



# **WARNING!!!**

**Serious Injury or Property Damage**  
**may occur if array shifts while adjusting**  
**tilt angle without a safety line or winch**  
**attached and secured!**



**DO NOT** stand between post and lower side of the array while  
seasonally adjusting tilt angle.

**AND**

Tie a safety rope to top of array and wrap around car bumper or  
heavy permanent object to control adjustment of array.

Tighten the set bolts on the Tee HARD when you are finished  
adjusting.