NOTE: All holes shown are for bolt/wing nut connections that are included to make it easier to store this assembly. If storage of this assembly is not a concern, wood screws could be used instead of bolts and wing nuts, and all drilled holes can be skipped except for the bolts that hold the poles and the holes in TE-23003.

### Parts List

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TE-23007</td>
<td>Shark Fin</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>TE-23008</td>
<td>Cone Ramp Horizontal</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>TE-23010</td>
<td>Cone Ramp Crossbeams</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>TE-23011</td>
<td>Cone Ramp Vertical</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>TE-23012</td>
<td>Cone Ramp Gusset</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>TE-23013</td>
<td>Cone Ramp Diagonal Beam</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>TE-23015</td>
<td>Cone Ramp Diagonal Panel</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>TE-23016</td>
<td>Lower Pole</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>TE-23017</td>
<td>Upper Pole</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>CCF-RT-13-1</td>
<td>Pole Cap</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>tape_VISIONTARGET</td>
<td>tape_VISIONTARGET</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>hex_.25_20_2.5_partial</td>
<td>Steel Hex Head Screw, 1/4&quot;-20 x 2 1/2&quot;, partially threaded</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>hex_.25_20_3.5_partial</td>
<td>Steel Hex Head Bolt, 1/4&quot;-20 x 3.5&quot;, partially threaded</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>hex_.25_20_5.5</td>
<td>Steel Hex Head Bolt, 1/4&quot;-20 x 5.5&quot;, partially threaded</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>wing_.25_20</td>
<td>Steel Wing Nut, 1/4&quot;-20, 31/64&quot; Base Diameter</td>
<td>12</td>
</tr>
<tr>
<td>16</td>
<td>washer_flat_.25</td>
<td>Flat Washer for 1/4&quot; Screw</td>
<td>24</td>
</tr>
</tbody>
</table>

### Specifications

- **Dimensions are in inches.**
- **Material/Finish:**
- **Tolerances:**
  - Fractional: ±1/16
  - Angular: Machinable ±1° Bend
  - Two place decimal: ±1/32
  - Three place decimal: ±1/128
- **Do not scale drawing.**

### Comments

- **Comments:**
  - Remove all burrs and sharp edges.

### Drawing Information

- **Title:** Middle Cone Ramp
- **Drawing Number:** TE-23003
- **Scale:** 1:5
- **Sheet:** 1 of 9
- **Date:** 12/16/2022
- **Drawn by:** JO
- **Proprietary and Confidential Information:**
  - The information contained in this drawing is the sole property of FIRST®. Any reproduction in part or as a whole without the written permission of FIRST® is prohibited.

---

A A
B B
C C
D D
Step 1: Assemble floor frame of Cone Ramp with #8 wood screws as shown.

Please note orientation of all holes in 2 while assembling.
The holes in the two side beams should match up.
Step 2: Assemble 2x Cone Ramp Vertical assemblies using #8 wood screws as shown. Make a “left hand” and “right hand” version as shown.
Step 3: Assemble Cone Ramp Diagonal Assembly with #8 wood screws as shown. Note orientation of holes while assembling.
Step 4: If making the poles yourself, install the 10 caps to the end of the pipe with no holes with an arbor press or mallet.

There is a CAD file of a similar but not exact version of the cap in the shared CAD files for this assembly that can be 3D Printed.

Apply 2 pieces of 11 vision tape per pole as shown.

These poles with caps installed can be purchased from AndyMark. These do not include the drilled holes or applied vision tape.
Step 5: Attach the Vertical Assemblies to the Floor Frame using 1/4-20 x 2.5" Long Hex Bolts 12 and 1/4-20 Wing Nuts 15. Washers are optional.

Note the orientation of the 5 panels being on the inside of the frame.

This step can be done with wood screws instead of bolts and wing nuts if storage space is not a concern.
Step 6: Install Poles into assembly using 1/4-20 x 5" Long Bolts (14) and Wing nuts (15). Washers are optional. Note that the tall pole is the one closer to the vertical assemblies.
Step 7: Install Diagonal Assembly over the poles, and bolt into place with 1/4-20 x 3.5" Long Bolts (16) and wing nuts (15). Washers are optional.
Step 8: Attach 1 to each of the poles with cable ties that go around the poles, and through the holes in 1.
Upper Pole

Material/Finish:
1.25" SCH 40 Aluminum Tube

Dimensions are in inches.

Tolerances:
Fractional: 1/16
Angular: Mach 1° Bend: 1°

Two place decimal: 0.13
Three place decimal: 0.125

Comments:
Remove all burrs and sharp edges.

Do not scale drawing.

Unless otherwise specified:

Scale: 1:5

Drawing 1 of 1

Team: JO

Drawn: JO 12/21/2022

Title: Upper Pole

Proprietary and Confidential

The Information contained in this drawing is the sole property of FIRST®. Any reproduction in part or as a whole without the written permission of FIRST® is prohibited.