



MEMORANDUM

Date: March 30, 2006
To: Quality Assurance Team
From: New Product Development Team 2:
Jane Appel, Project Manager
Andrew Williams, Project Lead Designer
Re: Parts List and Assembly Instructions for Omega Tornado Tracker I

Background

The Omega Corporation has been commissioned by the National Weather Service to design the prototype of the Tornado Tracker I (the Tracker), a state-of-the-art vehicle that will allow for the tracking and study of tornadoes. The Tracker will gather data that will ultimately lead to an improved national early detection system for tornadoes. The unique construction of the Tracker will allow it to sustain heavy winds as well as impact and damage from debris to keep its operators safe while in the midst of up to and including an F4 Tornado.

This document provides step-by-step instructions for assembling a prototype of the Tornado Tracker. Correct assembly of the Tornado Tracker will ensure a thorough evaluation of this new product's marketability. In order to evaluate the prototype, this memo includes the Parts List and the Instructions to construct the prototype of the Tracker.

Guidelines

- The Tracker has been designed solely with parts found in the Omega Construction Kit.
- The Tracker should be constructed by paying close attention to the X and Y coordinate data given in the instructions
- In the event of questions or problems during construction, consult the troubleshooting section on page 9 of the instructions

Caution:

- All parts are used "as is" from the kit. Modifications to parts are not allowed and changes to parts will invalidate the prototype.

How this document is organized:

- **Page 3:** parts list with detailed specifications for each part
- **Page 4:** assembly instructions for the Tracker.

Part I:

- **Page 4:** instructions to collect needed parts from the Omega Construction Kit and place each part on a new sheet in the Kit.
- **Page 4:** instructions to make the number of copies of each part as listed in the "Quantity" section of the parts list.

Part II:

- **Page 7:** instructions to position each part in on the Design Pad Modeling to assemble the Tracker. For easy identification, each part type has its own section heading that contains the part's name.
- **Pages 4, 5, 6, 7, 8:** "Parts Point-check" to help you in the process. Use the Parts Point-check as a chance to review the completed sections for accuracy in your construction and to easily retrace your steps in the event of a disrupted construction process.
- **Page 10:** troubleshooting guide that will provide solutions for possible problem scenarios.

Parts List for the Tornado Tracker I

On this page is the parts specifications list for parts in the Omega Assembly Kit that will be used to construct the Tornado Tracker I. When you assemble the Tracker, use only the parts in number and quantity as listed on this sheet. The parts list contains 10 unique parts and 31 pieces and gives the following details:

Part No.: The reference number of each part

Quantity: The number of pieces for the part type

Shape: The major physical characteristic with which to identify the part

Color: The color of the part. In parts having more than one color, the dominant color(s) is given

Size: The size of the part, width x height, given in inches

Texture/Features: Any distinguishing features of the part

Note: N/A = Not applicable

Part No.	Quantity	Color	Shape	Size (width X height)	Texture/Features
1	1	Yellow	Rectangle	4 in. x 9 in.	-90° angle (Horizontal)
2	2	Gray/Black	Circle	1.5 in. x 1.5 in.	Radial Gradient
3	2	Light Green	Cross	1.5 in. x 1.5 in.	N/A
4	14	Light Gray	Circle	.5 in x .5 in.	N/A
5	4	Red	Square	1.5 in. x 1.5 in.	N/A
6	1	Gray/Black	Octagon	1.5in. x 1.5 in.	Radial Gradient
7	2	Light Green	Rectangle	.625 in. x 2.5 in	Vertical
8	1	Red	Hexagon	1.5 in. x 1.5 in.	N/A
9	1	Green	Oval	2.25 in x 1.5 in	Right-slanted line pattern
10	1	Yellow	Triangle	1.5 in. x 1.5 in.	Crosshatched line pattern
11	1	Red	Arrow	4in. x 1.3849 in.	Arrow head pointing right
12	1	Red	Human stick figure	0.7356 in. x 2 in.	Red circular head

How to Assemble the Tornado Tracker I

Instructions

These instructions will help you to assemble the Tornado Tracker I. In Part I you will create a new sheet, collect and place your parts on the sheet, and then make the number of copies needed for each part. Part II instructs you on how to assemble the Tracker by using the collected parts.

Part I: Collect Your Parts for the Tracker

This section instructs you on collecting the parts and then making the number of copies required for each part.

1. Create a new sheet in the Omega Kit

You will place the 11 unique parts on this sheet and make copies as needed for each part of the Tracker.

2. Part No. 1, the 4 in. x 9 in. Yellow Rectangle

This is the body of the Tracker.

Note: You will find the yellow rectangle positioned in your kit at an angle of -90 degrees. This -90 degree angle causes the yellow rectangle to appear to be a horizontal shape, rather than a vertical shape, as a width of 4 in. x 9 in. would indicate. -90 degrees and horizontal is the correct angle and position for this part.

Find the yellow rectangle in the kit and place it on the newly created sheet

3. Part No. 2, the 1.5 in. x 1.5 in. Black/Gray Gradient Circle

This is a wheel of the Tracker.

3.1 Find the black/gray gradient circle in the kit and place it on the sheet

3.2 Make **1 copy** of the black/gray gradient circle on the sheet

Parts Point-check

On your new sheet in the kit, you should now have the following parts and quantities:

1 Body (4 in. x 9 in. Yellow Rectangle)

2 Wheels (1.5 in. x 1.5 in. Black/Gray Gradient Circle)

4. Part No. 3, the 1.5 in. x 1.5 in. Light Green Cross

This is a wheel cover for the Tracker.

4.1 Find the light green cross and place it on the sheet

4.2 Make **1 copy** of the light green cross on the sheet

5. Part No. 4, the 0.5 in x 0.5 in. Light Gray Circle

This is a bolt for the body of the Tracker.

5.1 Find the light gray circle and place it on the sheet

5.2 Make **13 copies** of the light gray circle

6. Part No. 5, the 1.5 in. x 1.5 in. Red Square

This is a window for the Tracker.

- 6.1 Find the red square and place it on the sheet
- 6.2 Make **3 copies** of the red square on the sheet.

7. Part No. 6, the 1.5 in. x 1.5 in Black/Gray Gradient Octagon

This is the Tornado View Finder

- 7.1 Find the black/gray gradient octagon and place it on the sheet

8. Part No. 7, the 0.625 in. x 2.5 in. Light Green Vertical Rectangle

This is a door of the Tracker.

- 7.1 Find the light green vertical rectangle and place it on the sheet
- 7.2 Make **1 copy** of the light green vertical rectangle on the sheet

9. Part No. 8, the 1.5 in. x 1.5 in. Red Hexagon

This is the camera for the Tracker.

Find the red hexagon and place it on the sheet

Parts Point-check
<i>On your new sheet in the Kit, you should now have the following parts and quantities:</i>
1 Body (4 in. x 9 in. Yellow Triangle)
2 Wheels (1.5 in. x 1.5 in. Black/Gray Gradient Circle)
2 Wheel Covers (1.5 in. x 1.5 in. Light Green Cross)
14 Bolts (0.5 in. x 0.5 in. Light Gray Circle)
4 Windows (1.5748 in. x 1.1811 in. Red Rectangle)
1 View Finder (1.5 in. x 1.5 in. Black/Gray Gradient Octagon)
2 Doors (0.625 in. x 2.5 in. Light Green Vertical Rectangle)
1 Camera (1.5 in. x 1.5 in. Red Hexagon)

10. Part No. 9, the 2.25 in. x 1.5 in. Green Oval with a right-slanted line pattern

This is the directional navigator for the Tracker.

Find the green oval with a right-slanted line pattern and place it on the sheet

11. Part No. 10, the 1.5 in. x 1.5 in. Yellow Triangle with a crosshatched line pattern

This is the antenna for the Tracker.

Find the yellow triangle with a crosshatched line pattern and place it on the sheet

12. Part No. 11, the 4in. x 1.3849 in. Red Arrow with its arrow's head pointing to the right

This is the air fin for the Tracker.

Find the red arrow with its arrow's head pointing to the right and place it on the sheet.

13. Part No. 12, the 0.7356 in. x 2 in. Human Stick Figure with a red circular head

This is the operator of the Tracker.

Find the human stick figure with a red circular head and place it on the sheet.

Parts Point-check



You should now have on your sheet the correct number of parts needed to assemble the Tracker. Check your sheet against the parts list for accuracy.

Part II: Assemble the Tracker

On your new sheet you have collected all the parts and made the number of copies for each part. Now you can begin to assemble the Tracker. This section will instruct you on how to position each part using precise coordinates to assemble the Tracker on the Design Pad Modeling. It is important that you pay close attention to the "center-center" X and Y coordinates when constructing the Tracker. The precise placement of the parts is essential to the Tracker's optimal working condition.

Note: Unless otherwise indicated, all positions given for coordinates are stated as "center" position. The center position is the X and Y coordinate intersection located at the center point of each part.

1. Placing the body of the Tracker (Yellow Horizontal Rectangle)

Place the yellow rectangle, in a horizontal position, at the center coordinates of X = 7 in., Y = 3.25 in.

2. Placing the Wheels (Black/Gray Gradient Circle)

- 2.1 Place the first circular gradient at the center position of X=3.25 in., Y = 1.25 in.
- 2.2 Place the second circular gradient at the center position of X=10.75 in., Y = 1.25 in.

3. Placing the Wheel Covers (Light Green Cross)

- 3.1 Place the first light green cross at the center position of X=3.25 in., Y = 1.25 in.
- 3.2 Place the second light green cross at the center position of X=10.75 in., Y = 1.25 in.

Parts Point-check

At this point in your construction, you should see parts layered in the following order: the Tracker body, 2 wheels, 2 wheel covers

You have used a total of 5 pieces. There are 26 pieces left to use in your kit.

4. Placing the Bolts (Light Gray Circles) . The 14 gray circles are placed at the following coordinates:

- 4.1 X = 2.75 in., Y = 5 in.
- 4.2 X = 3.25 in., Y = 5 in.
- 4.3 X = 3.75 in., Y = 5 in.
- 4.4 X = 4.25 in., Y = 5 in.
- 4.5 X = 4.75 in., Y = 5 in.
- 4.6 X = 5.25 in., Y = 5 in.
- 4.7 X = 5.75 in., Y = 5 in.

4.8 X = 8.25 in., Y = 5 in.

4.9 X = 8.75 in., Y = 5 in.

4.10 X = 9.25 in., Y = 5 in.

4.11 X = 9.75 in., Y = 5 in.

4.12 X = 10.25 in., Y = 5 in.

4.13 X = 10.75 in., Y = 5 in.

4.14 X = 11.25 in., Y = 5 in.

Parts Point-check

At this point in your construction, you should see pieces layered in the following order: the Tracker body, 2 wheels, 2 wheel covers, 14 bolts

You have used a total of 19 pieces. There are 12 pieces left to use in your kit.

5. Placing the Windows (Red Squares)

5.1 Place the first red square at the center position of X = 3.5 in., Y = 3.15 in.

5.2 Place the second red square at the center position of X = 5.25 in., Y = 3.15 in.

5.3 Place the third red square at the center position of X = 8.75 in., Y = 3.15 in.

5.4 Place the fourth red square at the center position of X = 10.5 in., Y = 3.15 in.

6. Placing the View Finder (Black/Gray Gradient Octagon)

Place the black/gray gradient octagon at the center position of X = 10.5 in., Y = 3.15 in.

7. Placing the Doors (Light Green Vertical Rectangles)

6.1 Place the first light green rectangle at the center position of X = 6.5 in., Y = 2.5 in.

6.2 Place the second light green rectangle at the center position of X = 7.5 in., Y = 2.5 in.

Parts Point-check

At this point in your construction, you should see pieces layered in the following order: the Tracker body, 2 wheels, 2 wheel covers, 14 bolts, 4 windows, 1 view finder, 2 doors

You have used a total of 26 pieces. There are 5 pieces left to use in your kit.

8. Placing the Camera (Red Hexagon)

Place the red hexagon at the center position of X = 7 in., Y = 4.5 in.

9. Placing the Directional Navigator (Green Oval with right-slanted line pattern)

Place the green oval at the center position of X = 7 in., Y = 6.5 in.

10. Placing the Antenna (Yellow Triangle with crosshatched line pattern)

Place the yellow triangle at the center position of X = 7 in., Y = 5.75 in.

11. Placing the Air Fin (Red Arrow with arrow's head pointing to the right)

Note: The arrow is the only part that can not be placed by "center" X and Y coordinates. The coordinates given are for **left** edge and **horizontal** center.

Place the red arrow at Begin X = 7.875 in, Begin Y = 5.5 in.

The complete placement coordinates for the red arrow is:

Begin X = 7.875 in

Begin Y = 5.5 in

End X = 11.875 in.

End Y = 5.5 in

12. Placing the Tracker Operator (Human Stick Figure With red head)

Place the human stick figure at the center position of X = 7 in., Y = 2.25 in.

The Tornado Tracker I assembly is now completed.

Congratulations on the successful construction of the Tornado Tracker I.

Troubleshooting Guide

<i>Problem</i>	<i>Solution or Explanation</i>
Cannot locate a missing part	<p>Check the parts list to confirm the specific attributes that make the part unique: shape, size, color and texture</p> <p>Carefully check each sheet in the Omega Construction Kit against the part's specifications to locate the missing part</p>
Additional parts are leftover after construction	<p>Identify the part by its specifications on the parts list</p> <p>Go to "Part II: How to Assemble the Tornado Tracker I"</p> <p>Locate the section heading that has the part's name</p> <p>Review each step in the section to place the parts</p>
A part does not seem to be in the correct position on the Design Pad Modeling	<p>Identify the part by its specifications on the parts list</p> <p>Go to "Part II: How to Assemble the Tornado Tracker I"</p> <p>Locate the section heading that contains the part's name</p> <p>Review the center coordinate placements for all parts of this type within this section</p>