The NEED Project

**Turbine Assembly**

**You Will Need**

- 3 Legs
- 1 Center hub
- 1 Locking disc
- 1 Wood tower
- Nacelle (pre-assembled)
- Gears
- 12 Hole crimping hub
- Blades

**Tower Assembly**

1. Lock one leg onto the center hub.
2. Attach the two other legs in the same way.
3. Slide the locking disc on to the tower about 3 inches.
4. With the teeth of the locking disc pointing down, insert the tower into the center hub, locking the tower in place.

**Turbine Nacelle**

1. The turbine nacelle comes pre-assembled as part of the NEED wind kit. The hub, gears, and motor can be removed and rearranged, depending on the investigation. See page 26 for directions on changing gears.
**Turbine Gears and Motors**

1. The 16, 32, or 64 tooth gear will lock into the small Hex-Lock. You can choose to mount the gear on either side of the nacelle, but we recommend mounting your gears on the side of the nacelle opposite from the hub. This makes it easier to interchange gears and manipulate your blade pitch.

2. You will now need to move your DC motor up or down so that the pinion gear (the smallest gear in a drive train) meshes with the gear on the hub.

**NOTE:** If you are using the largest gear size, you will notice that it will only fit with regular nuts under the motor mounts, as wing-nuts are too tall. If you are using the smallest gear size, you will have to use regular nuts above the motor mounts. Give the hub a spin to make sure that the gear turns and rotates the small pinion gear on the motor.

**USING THE 16-TOOTH GEAR (SMALLEST RATIO)**

- Since the 16-tooth gear is so small, it is challenging to get the generator high enough in the main body to mesh gears. In order to use this small ratio, you have to use the thinner generator. Remove the upper half of the motor mount and slide a small cardboard or folded paper shim in between the generator and the main body housing. You will have to adjust the width of this shim to get the gears to mesh perfectly. Tighten the nuts below the motor mount to secure the generator in place. If the gears do not mesh well, adjust your shim.

**Adding the Hub and Blades**

1. The HEX shaped driveshaft allows you connect the Hex-Lock to the driveshaft. If you mount your gears or a weightlifting spool on the back of the nacelle, it will not slip on the driveshaft.

2. The Hex-Lock allows you to quickly interchange and lock gears in place on the driveshaft. Your gear will fit snugly onto this adapter. Slide the Hex-Lock and your gear up the driveshaft right behind the hub, as shown in the picture. Again, be sure to line up the main drive gear with the pinion attached to your DC motor.

3. The completed nacelle will slide right onto your tower. You can secure the nacelle in place by screwing in one or two more small screws in the holes at the bottom of the nacelle.

4. Turn the knob on the front of the hub to loosen the two hub sides. Do not turn the knob too far or the hub will separate completely.

5. Place the blades into the slots. Tighten the hub to hold the blades in place.