IUEE

Quadcopter Assembly

Quadcopter Assembly – IUEE arms and rotors.

You will need the four plastic cutouts for the "landing gear". One is blue and is the "front" rotor arm. The other 3 are clear plastic. For each rotor, use 2 shiny metal screws from package #1 (8 total), a gold rotor, a blue arm and a plastic landing gear cutout.

Repeat for each rotor/arm assembly.

Place the gold rotor on top of a blue arm. Using a Phillips screwdriver, connect the plastic landing gear cutout below the arm with the 2 screws. The screws should connect the plastic landing gear, the arm and the rotor together. The rotor wires should be on the same side (left, when looking toward the center of the copter) of the arm assembly.

[HINT: This might take two team members to hold the components in place.

A shortcut -Try screwing one screw with just the rotor and arm, to align the holes, on the side without the wires. Then screw in the second screw through the plastic landing gear, the arm and the rotor, tightly. Now, remove the first screw (be careful when removing the screw, it may 'pop' out at you!), push the plastic landing gear in place and tighten.]

You should now have 4 rotor arm assemblies ready for the next step.

Quadcopter Assembly – rotor arm to center base.

You will need the four rotor arm assemblies, the "odd" shaped center plastic base, 8 black plastic screws, and 8 dull metal standoffs (size?).

Connect each of the 4 rotor arm assemblies to the base using 2 of the screws and the standoffs (as shown in the model).

[HINT: Notice the base pattern. The narrower edges connect to the front and back rotor arm assemblies. The wider edges connect to the side rotor arm assemblies.]

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Quadcopter Assembly – Connect Arduino and shield to base.

You will need the center base assembly (assembled with the rotor arms), the Arduino board, the shield board, 4 long plastic standoffs (package #x), 4 short plastic standoffs, 4 long black screws (with a "hex head"), and 4 regular nuts.

The shield will go on top of the Arduino board, separated by the long plastic standoffs. Below that are the short plastic standoffs between the Arduino board and the center base assembly. The four screws go through this whole "stack" of components, and are tightened in place with the regular nuts.

[HINT: This might take two team members to hold the components in place.

Insert a screw thru the shield board, long plastic standoff, and Arduino board. Push the short standoff on, followed by the center base assembly. Tighten loosely, using the nut..

Repeat on an adjacent screw (tilting the board, can be done a bit if the first screw is "loose"). Follow with the next two screws. Then tighten up all 4 screws/nuts.

Quadcopter Assembly –actuators to rotos

You will need the center base assembly, 4 sets of Velcro, and 4 mini actuator boards.

Connect each set of 3 actuator wires to the rotor. Place the Velcro strip on the bottom of the center base plastic so that the actuator board "lines up" with the green connector on the Shield. Connect up the voltage pins and signal pins. The connectors are + (red wire) and – (black wire) for the voltage pins. The signal pins (green connector) should have the black wire on the board edge and the white wire toward the board center.

[HINT: BE CAREFUL NOT TO JAM THE WIRES TOGETHER TOO HARD. THE WIRES MIGHT BREAK!]

Spin test.

Do a spin test of your rotors. You will need a battery to connect to the Shield board. The front (blue) and rear rotors should be spinning counter-clockwise. The two side rotors should be spinning clockwise.

If a rotor is spinning the wrong direction. Take two of the rotor wires on that rotor and "flip" the connections. This is a 3-phase rotor and that will change the spin direction.

Continue Assembly.

Quadcopter Assembly –center base w/ boards to top plate.

You will need the center base assembly, 8 black nuts, 8 locking nuts, and 8 very long shiny screws (package #).

Connect the top plate (lining up the Intel logo) to the center plate using the nuts and screws.

[HINT: Screw 2 regular nuts down on each screw. Place the screw in the hole on the center assembly. Tighten the locknut. Repeat for other 3 screws. Place the top plate on the screws and tighten the top locknuts. Then tighten the 8 regular nuts, so that the assembly is stable.]