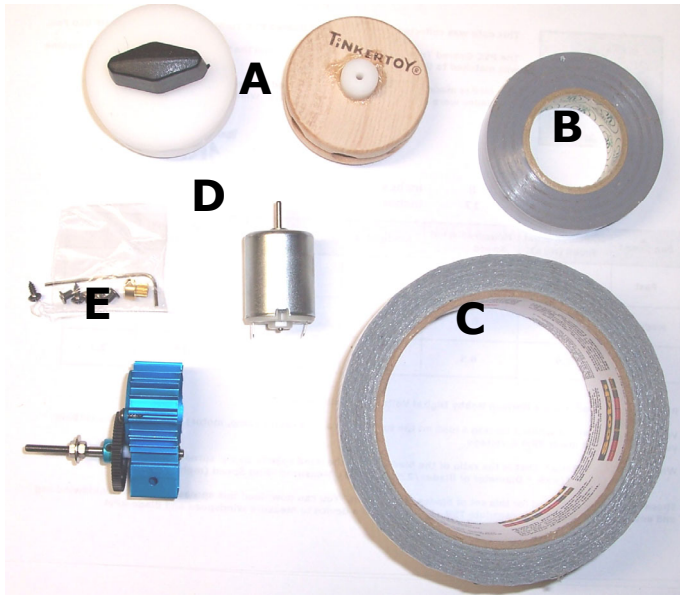


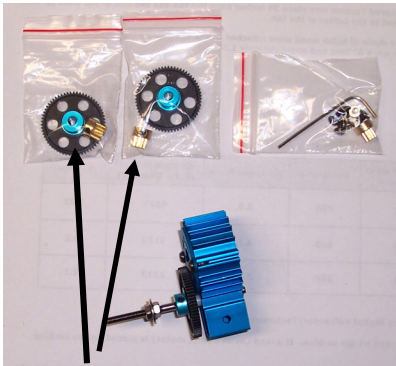
## Making a Geared PVC Nacelle Assembly

We are aware that there are lots of ways to make geared assemblies. This is one idea that has worked well for us. The same theory will work for other parts...but we will let you explore that.



- (A) Hub to attach blades.
- (B) Electrical Tape
- (C) Duct Tape
- (D) Small DC Motor
- (E) Gearbox Assembly

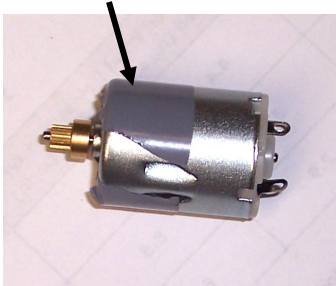
The gearbox is used in small model electric planes. Very rugged....pricey at \$25. But it will last forever and kids can beat on it. Kidwind makes crimping and Tinkertoy hubs. You can buy some tinkertoys or cut some round pieces of wood and make your own. The motor is from Kelvin Electronics.



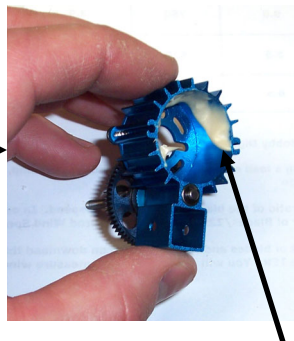
The gearbox comes with a variety of gear ratios. On Kidwind models we use the 6.6:1 spurs. It also includes a 5:1 and 3:1 Spur. Might be fun to experiment with different ratios.

### Additional Gears

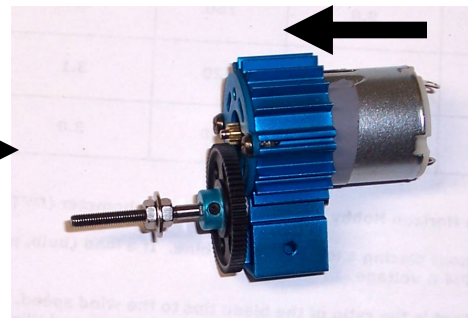
Electrical Tape



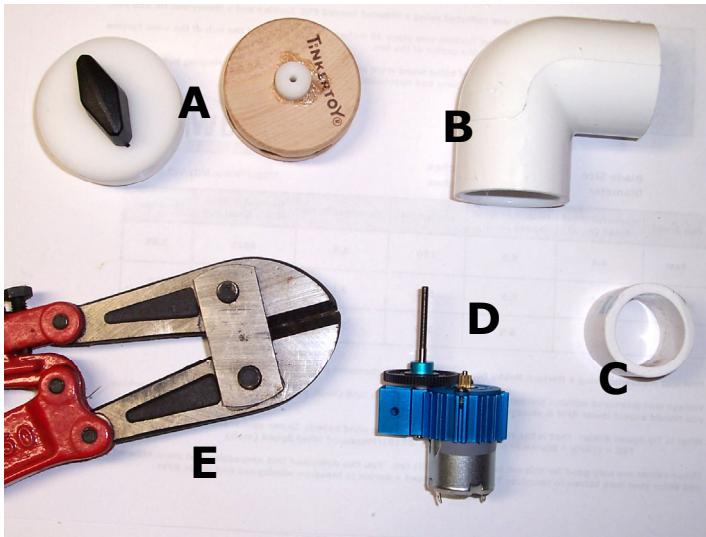
Using an allen wrench attach the small spur to your DC motor. To shim fit the motor in the gearbox add some electrical tape.



Apply some glue (Liquid Nails) to the inside of the gearbox. Not too much just enough to secure.

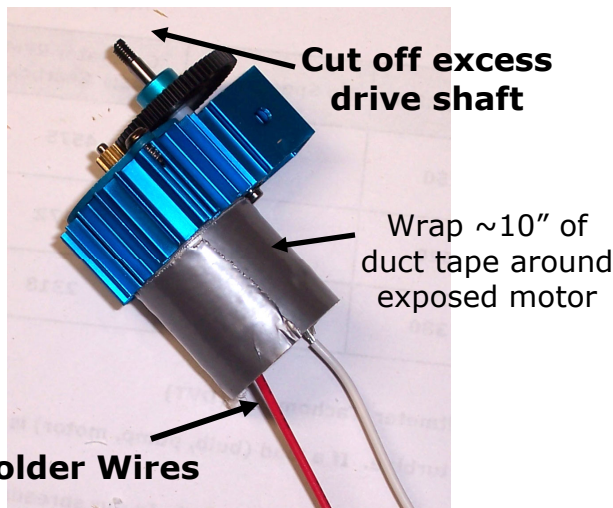


Insert the motor w/spur into the gearbox. Make sure it is snug and the gears mesh and turn easily. Do not push it in too far or the spur will hit the gear adding friction.



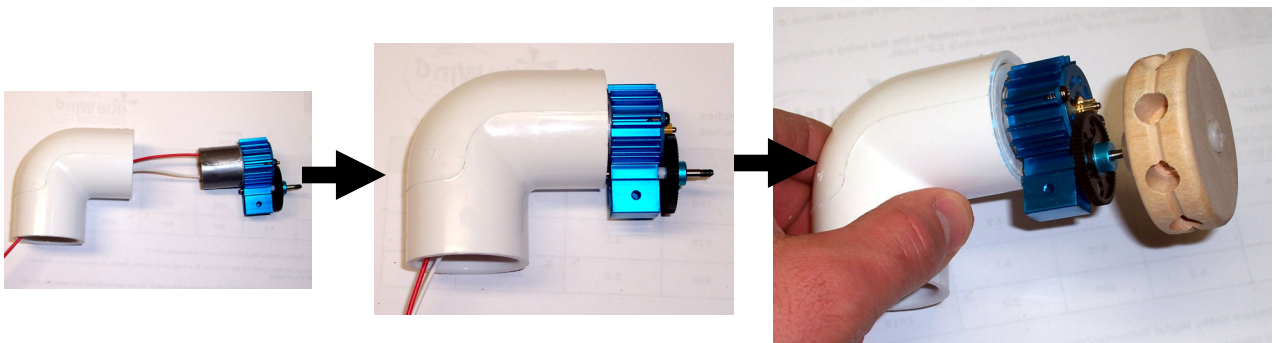
- (A) Hub to attach blades.
- (B) 1" PVC 90 Fitting
- (C) 1" long 1" PVC Pipe
- (D) Gearbox assembly
- (E) Bolt Cutters

Let your gearbox dry overnight and prepare the above components.



Using the bolt cutter remove some of the main drive shaft. If you do not the shaft can easily snap off when attaching the hub. Solder on some wires. Wrap 10" of duct tape around the exposed motor to shim fit into the PVC fitting.

The PVC fitting will house the gearbox assembly. Insert the 1" long pipe into the fitting. Make sure it is a pretty flush fit.



Align the parts like the picture above. Make sure that you have wrapped enough tape around the exposed motor so it fits snugly in the fitting. If it is too tight remove some tape. Put some glue (Liquid Nails) in the fitting and insert the assembly. Let dry overnight and attach hub. Now you have a rocking little turbine.



## Other Gearboxes

There are other ways to make gearboxes to get more power output. Below are some models that Kidwind utilizes. You can make your own gearboxes like these or online stores like Kelvin, Pitsco and Boreal Labs have the parts. Keep in mind it is hard to get gears to mesh and wind turbines can spin very fast. Parts that are not properly aligned will fail sooner or later. That is why on all the turbines we build we use a \$30 gearbox built to withstand 1000s or RPM.

