A RECOMMENDED EQUIPMENT

Engines

The Reaction 54 is designed for tubines in what is commonly known as the "12-lb. Class". The BTE prototype models have been thoroughly tested with a RAM 500 which puts out 11+ pounds of thrust and a PST J600R which puts out 14 lbs. of thrust. Therefore, the R54 airframe is rated for a maximum thrust of 14 lbs. Through continued refinement, the engines in this class are now putting out more power. If necessary, limit the thrust of your turbine by programming your ECU to a new, lower maximum rpm (check with the manufacturer for the proper rpm setting). A list of suitable turbines is presented on the next page.

Radio and Servos

You will need at least a six-channel radio for the R54. To comply with AMA Safety Regulations, all radios used in turbine-powered models must be equipped with fail safe and ECUs shall be configured to shut down the engine within two seconds of fail safe activation. You will also need some mixing functions, primarily to add a bit of down elevator with flap deployment. Personally, I have settled on the Futaba 9C transmitter because it is easy to program, has lots of mixing functions, and has slider switches for flaps, which I consider much easier to use than knobs.

Every turbine pilot has their own opinion on servos. This is an entry-level turbine model designed to fly at modest speeds with an eye towards economy. The place to economize, however, is not with your servos! Digital servos are mandatory for all of the flight control surfaces. Prices for digitals are coming down, and there is a wide selection from all the radio manufacturers. Digital servos also offer an extra level of security against flutter thanks to their ability to "lock in" around neutral. There have been no problems with the Hitec servos used in the prototypes, so I will use their specifications as minimum requirements, as follows:

Ailerons (2 servos) and Rudder (1 servo)	Hitec HS-5625MG - 110 oz.in. @ 4.8V	Dual BB, Metal Gears
Flaps (2 servos) and Elevator (1 servo)	Hitec HS-5645MG - 143 oz.in. @ 4.8V	Dual BB, Metal Gears
Nosewheel Steering (1) and Retract Valve (1)	Hitec HS-225MG - 54 oz. in. @ 4.8V	Top BB, Metal Gears

Retracts

The R54 was designed around the Robart 500-series retracts. The Retract Package from BTE uses Robart #530 units for the main wheels and #563 for the nose wheel. The nose wheel unit was particularly attractive to me because it has mounting holes for both firewall and belly mounting. It seemed natural to me to design the model to utilize both sets of mounting flanges for maximum strength, and it has proven its strength in flight testing several times. (Translated: I've made some really bad landings that should have torn the gear out, but both the Robart gear and the airframe took the punishment with no damage beyond bent struts!). There are other retract units on the market that can be substituted, but I haven't tried them and cannot recommend their use. If you want to try different retracts, it will be up to you to engineer their installation.

Header Tank / Air Trap

In addition to the Du-Bro 60 ounce fuel tank, I recommend using a header tank for reliable fuel flow to the turbine. The most popular header tank in use today is the BVM Ultimate Air Trap (UAT). It is what I used in the prototypes and is shown on the plans. The UAT is a special header tank that incorporates a fibrous bag to trap air bubbles, preventing them from getting to your turbine and possibly causing a flameout. It holds four ounces of fuel, bringing the total fuel load to 64 oz. There are several less expensive alternatives on the market now and they should all work fine. Visit www.dreamworksrc.com for a wide selection of header tanks and lots of other turbine-related products.

Recommended Engine List

The Reaction 54 is designed to accommodate tubines in what is commonly known as the "60N Class" (“N” is for Newton, a measure of force). Most of these engines are based on a design pioneered by the Wren company in England which used a 54mm diameter compressor wheel. In fact, Wren supplied the critical turbine wheel for many of the early engines in this class.

JetCat P60-SE

The chart shown here is a list of turbines that are suitable for the R54. Most of the information is taken from the websites of each company. Things change fast in the turbine business, so please use this list as a starting point for your research into the ideal turbine for your Reaction 54. Engines are shown in alphabetical order.

Company/Turbine	Made In	Max Thrust	RPM Range	Diameter	Weight
JetCat P60-SE	Germany	13 lb.	50,000 - 165,000	3.25”	1.87 lb.
Comments: "Undersize" turbine that is light and powerful. Gas start. Great runner, great support. **BTE Combo Deal!**					
JetCat P-70	Germany	17.5 lb.	35,000 - 123,000	3.7”	2.6 lb.
Comments: Oversize, but will fit on R54. No longer available, but used ones can be found.					
Jet Central Bee II	Mexico	14 lb.	55,000 - 180,000	3.15"	1.7 lb.
Comments: Well-established turbine. Smaller diameter than typical "54". Gas or kero start. **BTE Combo Deal!**					
KingTech K-60G	Taiwan	13.22 lb.	50,000 - 162,000	3.22"	1.88 lb.
Comments: Tight, light unit features kero start. Great price, and building a great reputation. **BTE Combo Deal!**					
KingTech K-80G	Taiwan	19 lb.	45,000 - 145,000	3.75"	2.88 lb.
Comments: Big and heavy for R54, but powerful. K-60G is a better choice for this plane. **BTE Combo Deal!**					
PST J600R	Thailand	14 lb.	55,000 - 160,000	3.5"	2.2 lb.
Comments: Beautifully-made Wren-based engine. Full Autostart. Shown on plans.					
PST J800R	Thailand	18 lb.	55,000 - 153,000	3.5"	2.2 lb.
Comments: Larger and heavier than the J600R. Full Autostart. Built-in FOD screen.					
Wren 80 i-Kero	England	18 lb.	50,000 - 160,000	3.5"	2.2 lb.
Comments: Ultra-efficient, optimized MW-54. Same size, more power. Factory assembled only.					

Larger Turbines - The great modeling tradition of trying to shoehorn as big an engine as possible into an airframe can get you in trouble with the R54. The next larger turbines over the ones listed here are physically too large to fit in the intended engine area of the R54. Besides that, their weight and higher idle thrust are both problematic. Bottom line: Don't use them on the R54.

Please visit www.btemodels.com for more information on how to save money with a **BTE Combo Deal!** ◀R54▶