

# Hungry Eagle for R/C



It goes straight up. An unlikely bird that's not exactly F/F or R/C either. Blame it on **Dick Sarpolus**

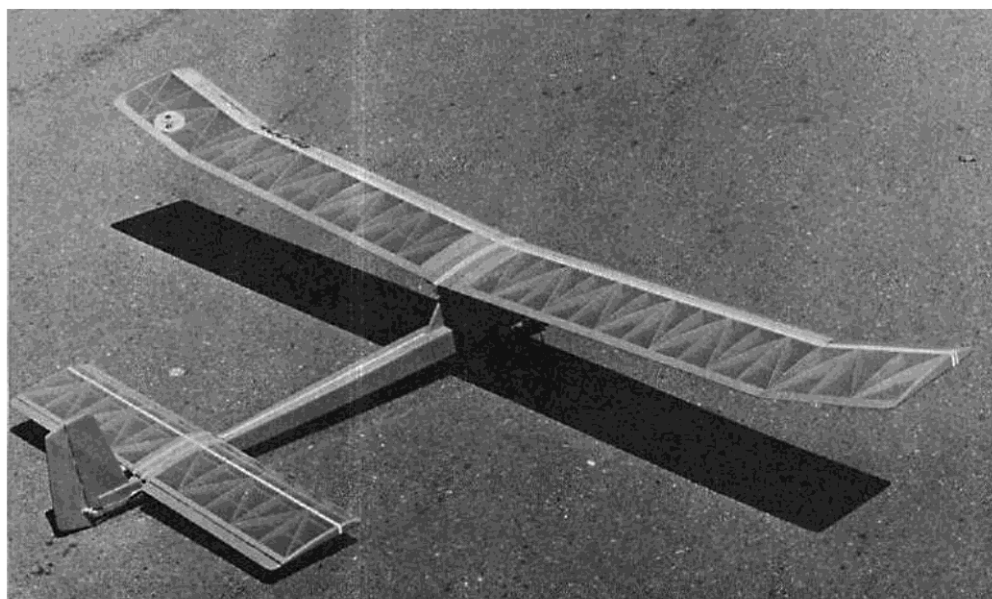
**T**o get a few things straight, 1. This is not a Free-Flight model; it is a fully Radio Controlled model. 2. I am not at all suggesting that Free-Flighers use radio control equipment in any manner. 3. I am suggesting that flying this type of R/C model is exciting, fun, challenging and there may be a good case for some sort of radio controlled power duration event.

I built this model for my own amazement and enjoyment, and have really been enjoying its performance. Free-Flight has always been a fascinating part of our hobby to me, and the screaming climb followed by the floating glide of a well trimmed model is a beautiful sight to see. Equally exciting is being able to control every part of a model's flight to the best of our ability with today's excellent radio equipment. I wanted a Radio Controlled model which would climb up in a hurry, and then be able to search out and ride the thermals. This resulting model is not eligible for any sort of existing competition flying - which makes it a sport model. The screaming climb behind the urge of a schmeerle .40 coupled with a floating glide has made the Hungry Eagle a real fun machine for me.

The design approach obviously is based on current Free-Flight technology, with a few changes to tailor it for Radio Controlled operation. First test flights showed this was not as easy as it would appear; the far rearward balance point suitable for a Free-Flight model's circling glide is not suitable for R/C flying, where we want to search out thermals and actively pilot the aircraft about. Trial-and-error testing showed that getting the balance point far enough forward resulted in a good flying, easily controlled aircraft.

Design-wise, we picked an eight foot wingspan as a size allowing use of 3/8" stock and a one-piece wing which will fit without much trouble in our car. Three foot main panels, one foot tip panels, and an 11" chord give a wing area of 1056 square inches. Spruce spars and balsa webbing for an I-beam structure give adequate strength

It sure looks like a Free-Flight, but it isn't. 96" in span, designed around a hot .40. Photo selection on these two pages tells the tale pretty well. a fully capable fast climbing thermal machine with just enough radio buried within to guide it in after a satisfying flight. It's a practical way to fly in wooded eastern regions. The model features a warp resistant wing structure, a typical competition F/F planform.



along with thin  $\frac{1}{16}$ " ribs for light weight. The stabilizer is similar, multiple spar construction, 36" span and 324 square inches area for 30% of the wing area. A flat bottom airfoil gives good penetration and soaring ability. A long fuselage of minimum cross-section was decided upon for stability and minimum bulk. Fuselage construction is simply balsa sheet with plywood doublers for strength where needed. The pylon wing mounting is probably not needed for strictly Radio Controlled operation, but was used for traditional appearance. No landing gear as such; landing skids only. We planned on vertical attitude hand launching with an adequate powerplant; a hot pylon racing schnuerle .40 seemed a good size. Not being hampered by any rules, I usually set the timer for about a 25 second engine run for a good long flight.

Mechanically, the engine was simply radially mounted on the nose. A  $1\frac{1}{2}$  ounce fuel tank was made; the engine uses a crankcase tap for pressure fuel feed. Engine run timing is done with a Tatone cut-off timer, although a friend is building this model to be fitted with a 3-channel radio installation and a throttled engine for fun flying. I'm sure it could be flown with an engine much smaller than a .40, but we wanted that vertical climb performance. The radio access hatch is on the bottom of the fuselage; nylon tubing pushrods are used back to the elevator and rudder, and the radio receiver antenna is inserted into a nylon tube installed back through the fuselage.

I am surprised that we don't have some sort of R/C power duration competition - Old Timer R/C is of course very popular but that event emphasizes Free-Flight style performance and of course precludes original, modern design effort. Perhaps we will see such an event in the future; if it appeals to you, try a Hungry Eagle for some fun.

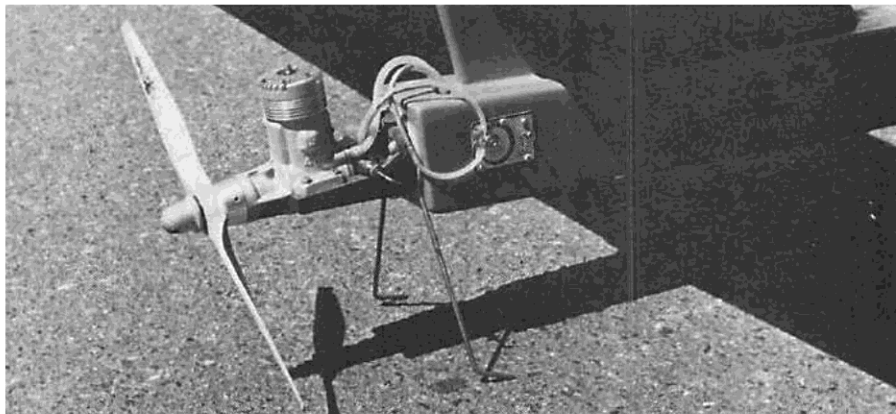
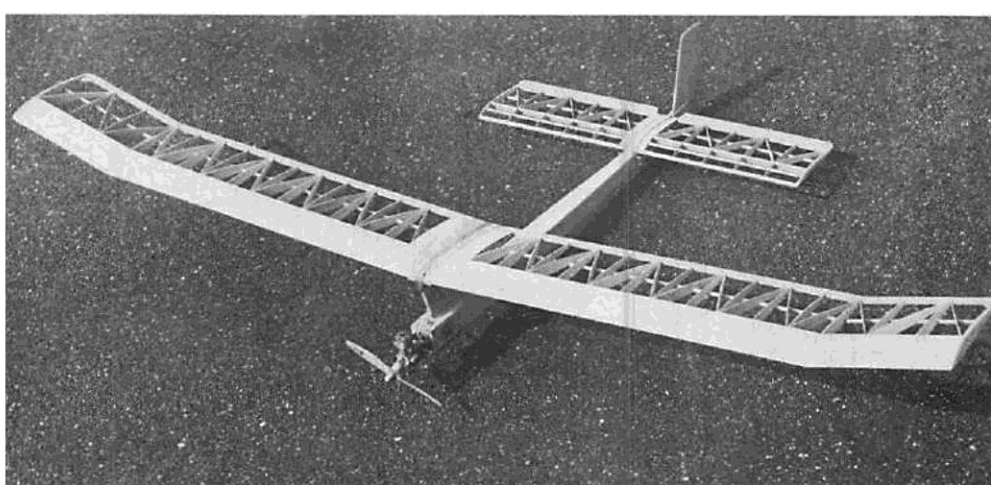
Flying technique is basic; a circling climb is not necessary, we just point it up and keep it going straightaway. When the engine cuts, a quick noseover and turn to prevent a stall, and we can begin searching for lift. The plane penetrates quite well and has been flown in strong wind conditions. The wing is strong; we have done a number of loops in the glide with no problems.

### Construction Notes

This can be brief, as the model is so easy to build. The Hungry Eagle was built in one week, after having first cut out all the parts. Making a ready-to-build kit saves construction time.

Let's start with the wing first. It's a flat bottom design makes for easy building. Starting with the bottom spars, the ribs, leading and trailing edges are glued in place. Vertical grain spar webbing is added next, followed by the top spar and leading edge planking. Leave the spar webbing out where the plywood dihedral braces will be added. Join the tip panels to the main panels, then the center dihedral joint, which is reinforced with epoxy and fiberglass cloth. Wingtips are simply rounded-off  $\frac{1}{4}$ " balsa. No wash-out or wash-in is used. The horizontal stabilizer is built just about like the wing, but with the added elevator.

The fuselage is next. A pylon was built first, over the plans. Fuselage sides are long, so locate the splices over the plywood doubler or add small  $\frac{1}{32}$ " plywood doublers, location depending on available wood lengths. Nose section  $\frac{1}{32}$ " plywood doublers



are epoxied to the sides. The  $\frac{1}{4}$ " plywood firewall and  $\frac{1}{8}$ " plywood nose pieces are used to join the fuselage sides, and the pylon is added, with its reinforcements to lock it solidly into the fuselage. The tail can now be pulled together and the top planking added. Before closing up the fuselage with the bottom planking, install the nylon tube pushrods and another nylon tube for the receiver antenna. A  $\frac{1}{8}$ " plywood nose cap is added and the nose section wrapped with light fiberglass cloth and epoxied for strength.

Detail finishing calls for a Tatone fuel cut-off timer, landing skids, mounting rails for the servos, holes for fuel lines, etc. MonoKote was used on the wing and stab, and the fuselage was painted. Rudder throw

should be considerable, while elevator travel can be minimal. The balance point location as shown on the plans has given good results; we would expect each model to need individual trimming to suit the flyer. Slow response to the rudder and a mushing, rather than a floating glide would indicate the balance point should be farther forward.

If the idea of an R/C power duration event sounds good to you, write to FLYING MODELS with your comments and/or suggestions. Perhaps we will see a follow-up article, discussing in more detail such a competitive event. If you fly sailplanes, with a model like this you won't need a winch or hi-start; it is noisy but the noise only lasts 20 seconds or so. Happy flying and watch out for a Hungry Eagle!

