

EKKO

Good aerobatic performance, functional, and realistic. This 40-powered compact fits in a VW.

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NOT SO MANY YEARS AGO, multi-aerobatic flying was practicable only with large models because of the heavy and space-consuming radio equipment then in use. There was no choice but to construct a large aircraft in order to keep the wing loading at an acceptable level as well as to provide room for the bulky units.

Because of new mini RC systems, full-house aerobatic flying with more compact designs is now possible. Obviously, a smaller model is more economical to build and to operate. An added, and appreciated, advantage is the convenience in transportation, especially for those with VW's or similar autos.

Ekko is a fast, smooth-flying machine intended for serious aerobatic purposes. It does very pretty figures and handles the FAI pattern well. Good performance was the primary design consideration, but functionalism and a realistic appearance also were basic goals. Too often good designs have a rather unrealistic flat look. However, since such high levels of flight performance in aerobatic radio control flying have been reached, more attention should be devoted to the aircraft's appearance.

Ekko has a high degree of serviceability, even under field conditions. Built-in arrangements have been kept to a minimum in order to facilitate handling. The entire nose section is as functional as possible, because this is usually a trouble spot. For maximum accessibility, the engine is installed in an open and upright position. The fuel system, nose gear assembly, etc., are



Large canopy is carved balsa. It gives the model plenty of side area and storage space for large receivers or servos, as well as strengthening the area above the wing.

easily reached for inspection or adjustment through a removable hatch in the fuselage. The hatch is fastened to the compartment with two screws.

Ekko employs a straightforward and rapid construction system. Both the wing and horizontal tail feature a constant chord layout. A wing with swept leading edges may offer somewhat better flight characteristics but constant chord is used for simplicity and accuracy.

The particular shape of canopy used on this model is not available commercially and molding a plastic canopy is a tedious process. To simplify construction, balsa blocks were used instead. This type of canopy is more solid than the molded ones. Strength here is of some importance because of the canopy's size.

Ekko's flight performance is comparable to the best 60 jobs. Design concepts follow general conventions but specific ideas from other aircraft influenced the final layout.

The model's most distinguishing feature is its deep fuselage which, in conjunction with a huge vertical tail, is especially valuable at knife-edge attitudes. The deep fuselage also is an asset in maneuvers such as Tail Slide and Figure M. The ability to maintain headings in some maneuvers is improved by the large fuselage side area.

From past experience, it is evident that excessive dihedral causes barreling in roll maneuvers. On the other hand, a flat wing has poor stability in the lateral plane. For a satisfactory compromise, the dihedral was made about two degrees on each wing panel. This amount

of dihedral, combined with a fairly short and stubby wing, makes constant on-the-wire rolls possible.

The full symmetrical wing section was selected because it is unequalled in inverted flight positions. This airfoil also seems to provide better grooving quality, especially under turbulent conditions.

Ekko has a 50-in. wingspan and its wing area is 460 sq. in. A suitable powerplant is a 23 to 40 engine. A 23 is about as small as is practical. With this engine size, the model should be docile, but vertical maneuvers might be difficult to execute.

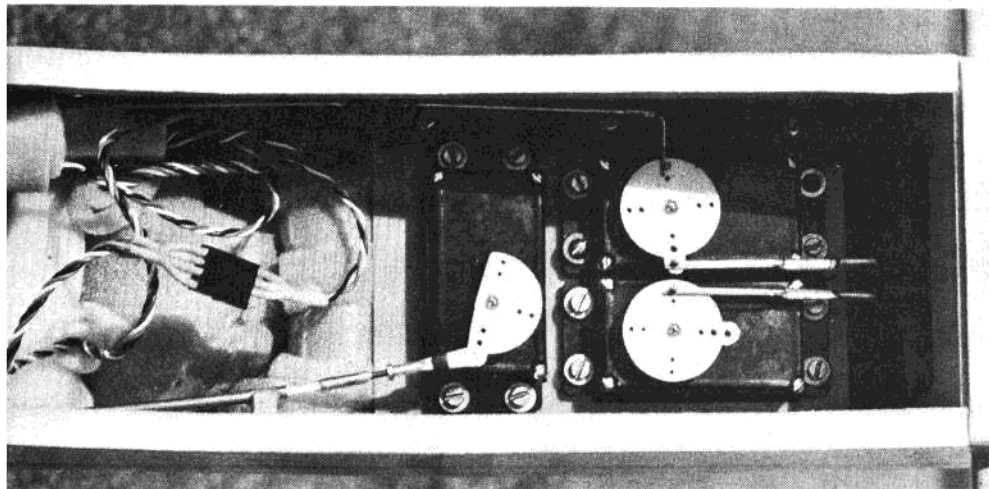
A 35 is about the best engine. It develops enough power to pull the machine safely through the entire schedule, yet at level flights the speed is not excessive. Above 35, the model would be something of a speed demon, probably more suitable for racing work (Open Pylon) than for precision aerobatics.

The prototype was powered by a Supertigre 35. The radio outfit was a K.O. Digiace four-channel digital proportional. With this installation, the all-up weight was approximately 4½ lb., which is a little on the heavy side. It is best not to exceed 4.25 lb.

The materials specified are intentionally on the large side because it is more convenient and rewarding to work with
(Continued on page 86)

Ekko, with a 35 engine, K.O. Digiace radio, at 4½ lb., flies like a 60-powered stunter.

One of the neatest equipment installations we've seen. It is both functional and compact.



Ekko

(continued from page 50)

oversize wood than with thinner and harder materials. To control weight, select only medium balsa.

Because of the nature of the design, Ekko is not for builders without previous multi experiences. However, those who have built and flown similar aircraft successfully should have no difficulty.

Construction is straightforward and requires little explanation. The wing can be built in one piece, or each half may be built separately, joined at proper dihedral angle when ready for sheeting. The ailerons are built integrally with each wing half, and then cut out after the sheet covering is completed. The fuselage side panels are prepared with the reinforcements prior to assembly.

To assemble the fuselage, formers FB and FC are first cemented to the sides. The sides are then pulled together at front and rear before the remaining formers, etc., are added. The rest of the building process is quite obvious.

Finishing technique is a matter of personal choice. Whatever method is used, make the model as light as possible. To obtain a long-lasting shining finish, the final fuel-proofer should be of good quality. I used an epoxy-type proofer on my original model.

There is ample room in the fuselage for any of the new digital systems. Servos are mounted on a $\frac{1}{8}$ " plywood plate, the plate itself is then fastened on hardwood rails with sheet-metal screws.

Normal checking procedures are followed prior to test flights. The engine downthrust is not critical, and you may start without any off-setting, applying downthrust as needed. The center of gravity is located as shown on the plan. The model must balance no further toward the rear than 3.5 in. from the leading edge.

Flying the ship should not present any problem to those familiar with this type of aircraft. Ekko is exact and responds instantly to commands. Low-speed characteristics are excellent, especially with the engine running. Without power, Ekko may run out of elevator sooner than expected in emergency landings.