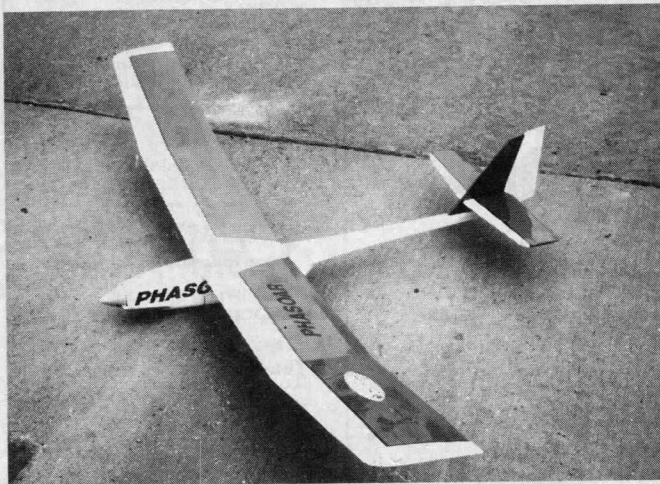
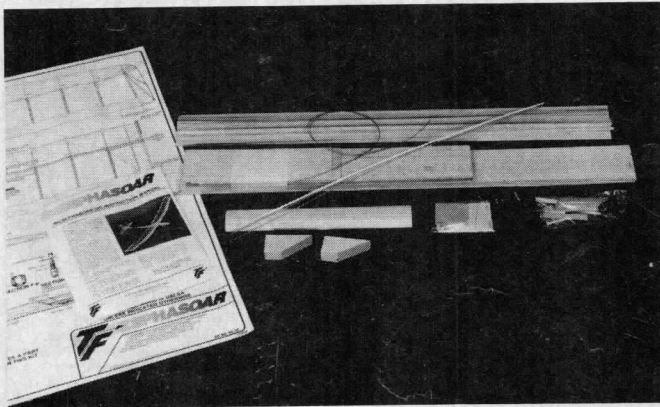


# RCM PRODUCT REVIEW

## Top Flite Models PHASOAR



**T**he Phasoar is a high performance electric powered glider from Top Flite Models. It is designed to use the Astro Flight Cobalt 035 motor and miniature radio control equipment. There are other motors which will fit into the Phasoar's nose, but only the Astro Cobalt 035 provides the high performance climbs to altitude that the Phasoar was designed for.

Looking at the Phasoar from a design point of view, the underslung removable battery pod is certainly its most distinctive characteristic. This feature allows access to the battery pack without removing the wing, and also dispenses with the need for a removable hatch which could weaken the slim fuselage. All in all, the removable battery pod is a unique design feature worth incorporating into other electric powered models.

From an aerodynamic sense, the Phasoar features an Eppler 205 airfoil, D-tube and capstripped wing construction, and an all moving horizontal stabilizer. The areas and moments are pleasing to the eye (ours, anyway), and if appearance means anything, the Phasoar looks like a well designed high performance aircraft.

### SPECIFICATIONS

Name .....	Phasoar
Aircraft Type .....	Electric Glider
Manufactured By .....	Top Flite Models, Inc. 2635 Wabash Avenue Chicago, Illinois 60616
Mfg. Sug. Retail Price .....	\$49.95
Available From .....	Retail Outlets
Wingspan .....	56 1/4 Inches
Wing Chord .....	6 Inches
Total Wing Area .....	335 Sq. In.
Fuselage Length .....	31 1/4 Inches
Stabilizer Span .....	14 1/4 Inches
Total Stab Area .....	40 Sq. In.
Mfg. Rec. Motor Range .....	Astro Flight Cobalt 035
Rec. Battery Size .....	5 Cell Pack 6.0V, 900 mA
Recommended No. of Channels .....	2-3
Rec. Cont. Func. ....	Rud., Elev., Throt.
<b>Basic Materials Used In Construction:</b>	
Fuselage .....	Balsa, Spruce
Wing .....	Balsa, Spruce
Tail Surfaces .....	Balsa
Building Instructions on Plan Sheets .....	Yes
Instruction Manual .....	Yes (20 pages)
Construction Photos .....	Yes

### RCM PROTOTYPE

Radio Used .....	Futaba Attack-E
Engine Make & Displacement .....	Astro Flight 035 Cobalt
Tank Size Used .....	5 Cell, 900 mAh
Weight, Ready to Fly .....	28.5 Oz. (1 Lb. 12 1/2 Oz.)
Wing Loading .....	12.2 Oz./Sq. Ft.

### SUMMARY

#### WE LIKED THE:

Design, appearance and flight performance.

#### WE DIDN'T LIKE THE:

Minor criticisms: 1) Errors in instructions, 2) Retention of removable motor pod.

#### Construction:

Construction of our Phasoar started with reading the 20 page instruction manual thoroughly. The manual is very detailed, and provides substantial detail on radio equipment selection, battery pack and propeller trade-offs, and electric motor system installation. The quality of electric propulsion information presented was very high and deserves special commendation.

The actual construction proceeded smoothly, aided considerably by Hot Stuff UFO adhesives — thin and medium, and "Hot Shot" accelerator. As mentioned before, the wing is a D-tube design (1/16" sheeted, upper and lower, from leading edge to main spar), with capstrips from the main spar to the trailing edge. The vertical and horizontal stabilizers are built-up balsa construction.

There were a few minor points to look out for. The installation of the aluminum tubes into the horizontal stab requires care to maintain good alignments, and care is also needed to properly align the horizontal stab trailing edges during assembly.

The removable motor pod is a basic balsa box which attaches to the lower fuselage, retained by wire pins on the front face, and at the rear by a 8/32 nylon bolt. The illustrated plans clearly show the layout of the motor pod, but the written instructions somehow omit any references to front former P-7. Build the pod as per the illustrated plans and "liberally" interpret the instructions in this area.

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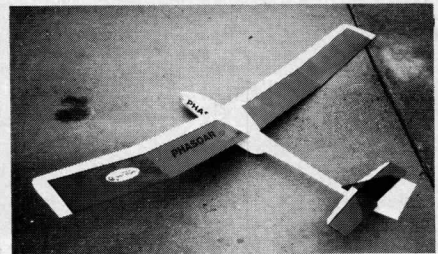
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sprayed white Aero Gloss dope. The black letter graphics were supplied by Vinylwrite Custom Lettering, and we were very pleased with Vinylwrite's selections and prompt service, as well as the final finished appearance.

### Flight Performance:

With a 5-cell pack of 900 Sanyo SCRs, Hobby Lobby's Graupner folding 7 x 3 propeller assembly and the aforementioned radio gear, our Phasoar tipped the scales at 28.5 ounces. With all the equipment checked out in the basement, it was time to go flying!

After a few hand tosses to verify trim, we started flight test evaluations. Exactly as advertised, the Phasoar has an outstanding climb with the Astro Flight 035 motor and Graupner 7 x 3 propeller, and an equally superb glide. With this particular combination of airframe and propulsion system, we had no difficulties boring up to thermal altitude three times on a single charge. The Phasoar definitely climbs best at a brisk forward speed and moderate flight angle, using the Eppler 205's thinnish airfoil to its best advantage. The Graupner folding propeller assembly is an absolutely first-rate piece of engineering; as can be seen from the photographs, its folded configuration enhances the Phasoar's low drag characteristics considerably. We were very satisfied with the Phasoar's overall flying performance, and are now looking for an Astro Flight Mini Challenger to fly against for comparison purposes.

As far as field experience with the removable motor pod, it was definitely convenient to service the battery pack by detaching the pod. However, we found that getting to the nylon retainer bolt at the pod's rear was less than convenient since there is limited screwdriver access. We substituted a ball wrench and an Allen head 8-32 with mixed results, and finally ended up using a simple external latch to fasten the motor pod; not as elegant a design solution, but considerably more serviceable.

### Conclusion:

The Top Flite Phasoar and Astro Cobalt 035 provides excellent electric flying performance in a compact package. For a high level of soaring performance, fly the Phasoar and climb and glide — silently! □

### Equipment Installation:

To provide guidance and control, we installed a Futaba Attack-E 4 channel system which features S-133 miniature servos and a fully MOSFET proportional speed control integrated with the receiver. The Phasoar is definitely designed around the use of micro sized radio components, so make sure that your intended radio equipment will fit properly.

The Astro Flight Cobalt 035 and the two S-133 servos are installed in the forward fuselage area, ahead of the wing leading edge. The Futaba speed control/receiver fits underneath the

wing; since this receiver draws operating voltage from the motor battery pack, there is no need for a separate receiver battery pack. There isn't a lot of extra room in the fuselage, what with the servos, wiring, electric connectors, and control linkages (the kit supplies thin stranded steel cables running in nylon housing — a nice touch).

### Covering:

Covering of the flying surfaces was with Super MonoKote, and the fuselage was painted using our standard technique of two thinned coats of clear, Black Baron primer, and

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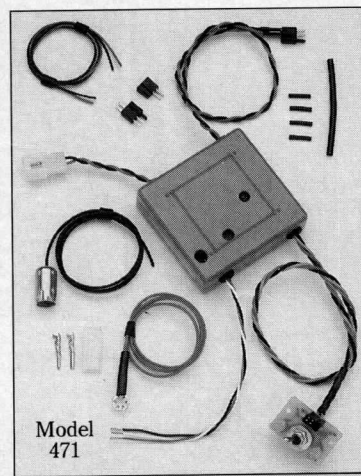
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