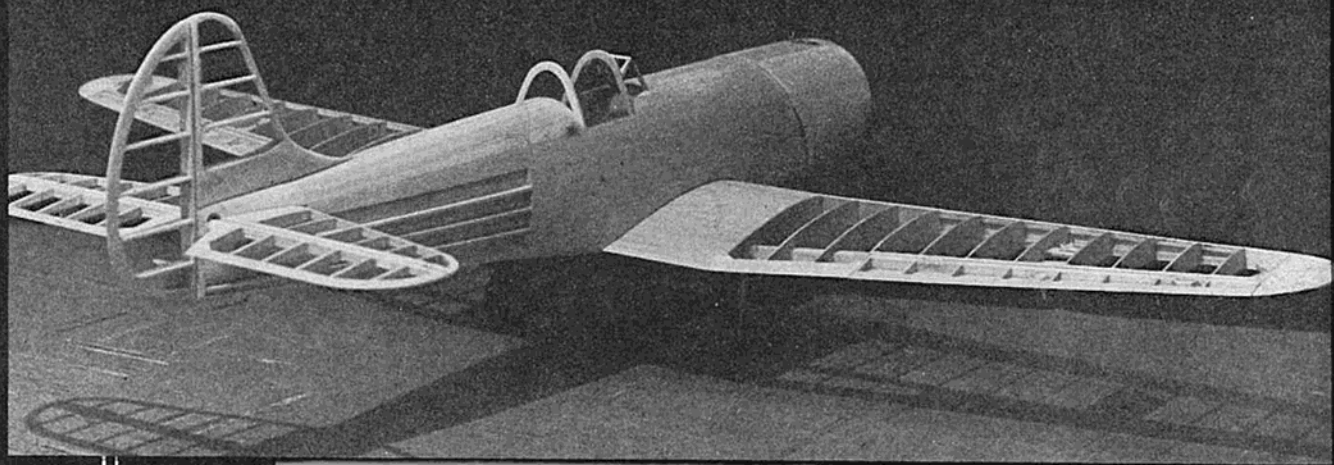
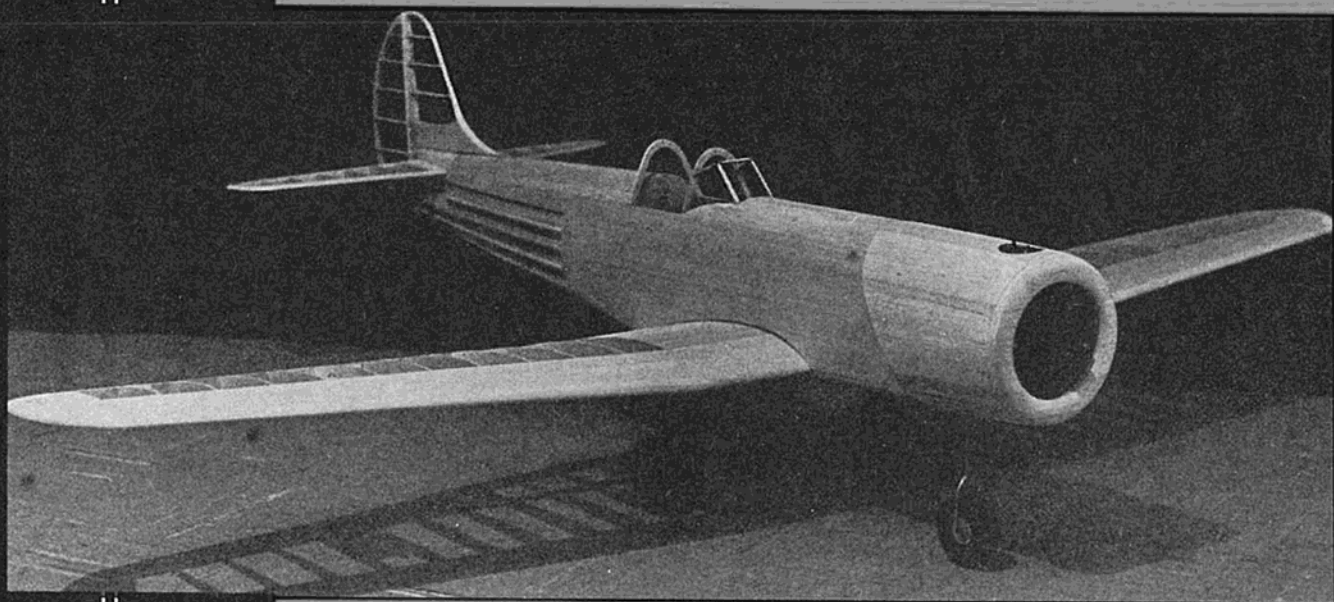
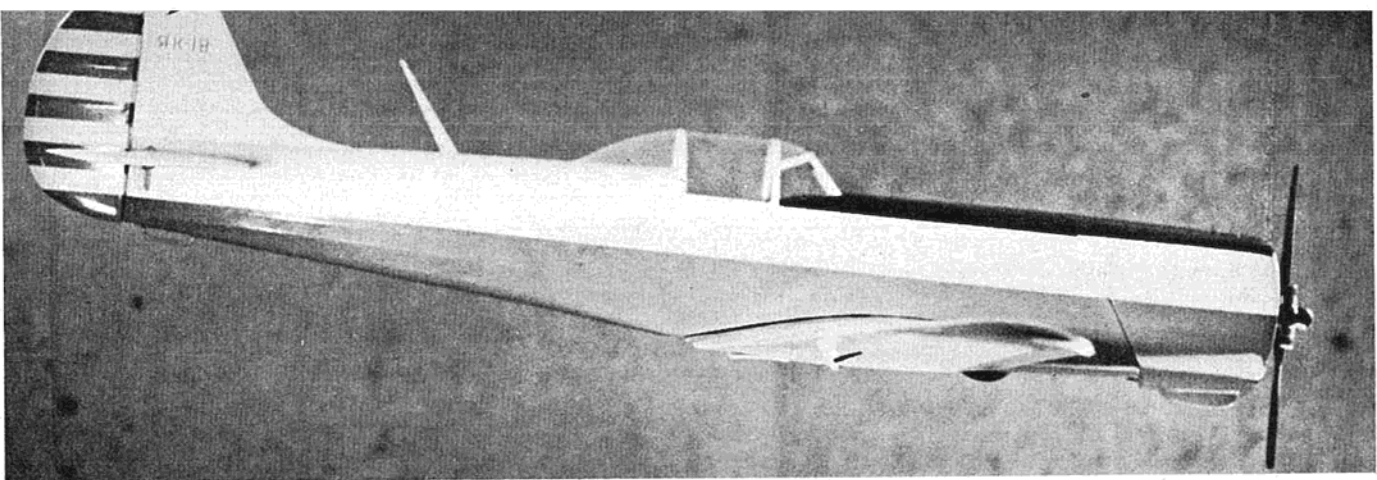


YAK-18



BY COLONEL H.G. BOWERS





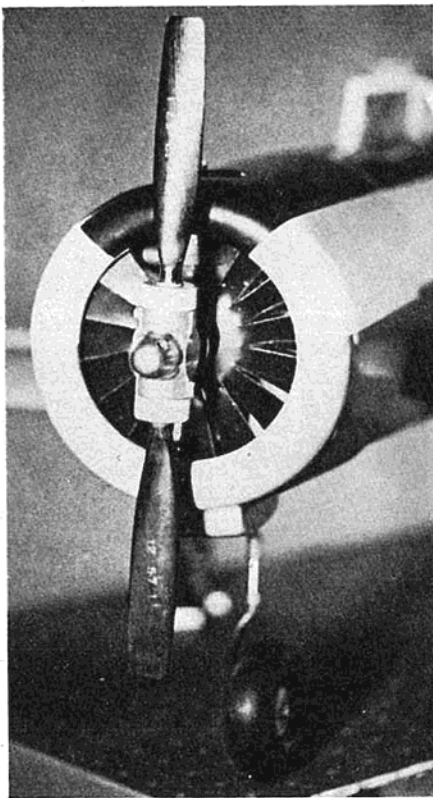
The R/C version of the Russian YAK-18 with gear retracted.

TWO years ago the YAK-18 PM made its debut into international aerobatic competition at Tushino Airfield, outside Moscow, where it captured top honors for the Soviet Union. Competing against the Iron Curtain countries were such noted competitors as Hillard, Krier, Herendeen, and Scholl, who made up the U. S. team.

The YAK-18 is a refined development of the well known trainer, and is equipped with a 294 hp engine, as compared to the 160 hp engine used in the latter. The canopy was modified and dihedral reduced to improve maneuverability. To reduce weight, non-essential electrical components were removed and fuel capacity reduced. These refinements were no doubt responsible for its superb climbing maneuvers, although the aircraft was reportedly somewhat limited in its roll responsiveness.

An initial glimpse of the YAK does not leave one particularly impressed since there is no outstanding or distinctive feature immediately apparent. However, upon closer examination, one develops an admiration for the clean lines and purity of design. It is a very simple airplane and there is no doubt that this very simplicity is, to a large extent, responsible for its efficiency and superb performance.

From the modeler's point of view, the YAK offers many advantages which can be fully exploited through the use of the new

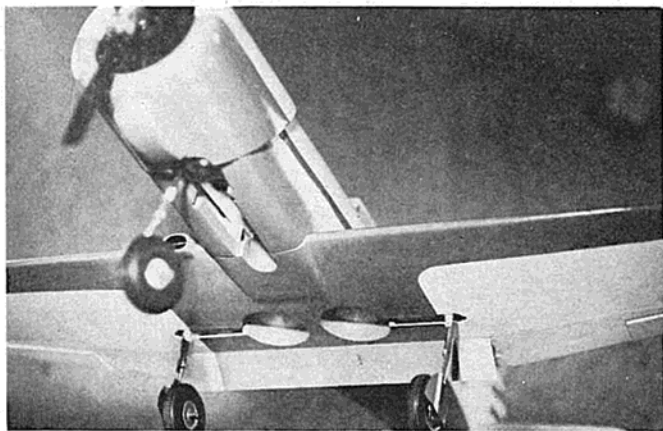


and reliable equipment available to the radio control flyer, such as light weight proportional gear and the remarkable Posi-Tract undercarriage units. The warm glow kindled by photographs of the YAK erupted when I obtained a set of three view drawings by Bjorn Karlstrom. It was readily apparent just how similar the proportions and configuration of this airplane are to the high performance, Class III radio control model. Many comments to this effect were passed between members of the Northern Virginia R.C. Club (the wives insist the R.C. stands for rooster club), and I began to seriously consider building the model. I contacted my chief technical advisor, Comrade Ernisky Greenovich, who is commonly known in the environs of Washington as Commander Ernie Green, USN, and after repeated calculations with slide rule and vodka bottle, we determined that the project was feasible and financable. The latter being determined by the fact that Ernie had a new Kraft radio, a set of Posi-Tract gear, and a Merco .61 hidden away in his workshop. We selected $1\frac{1}{8}$ inch to the foot scale since that size airplane would just fit into my engineering department (my daughter calls it "the pit"), and too, 64 inches is a good workable wingspan. This size was perfect for Ernie's equipment. After consultations with our two USAF experts, Col.

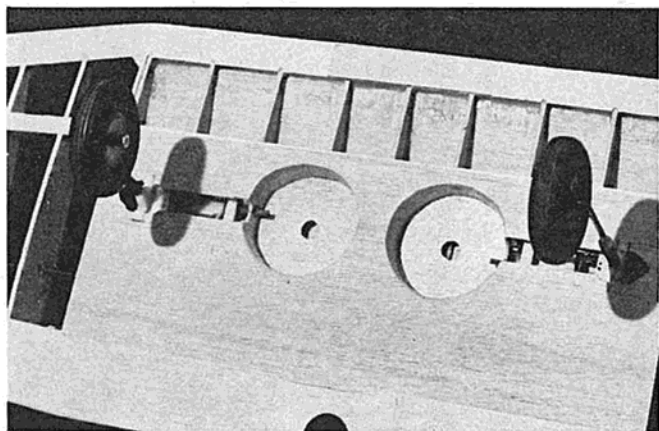
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"... Upon closer examination one develops an admiration for the clean lines and purity of design."

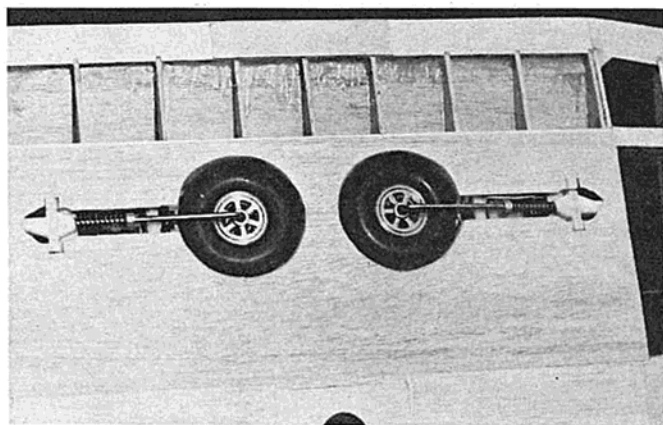




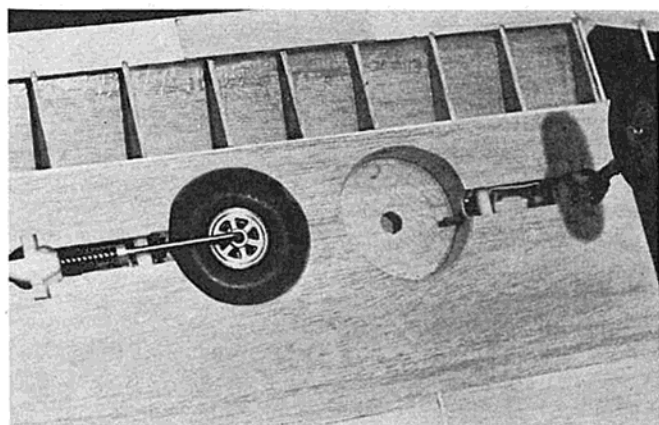
Detail shot of extended gear.



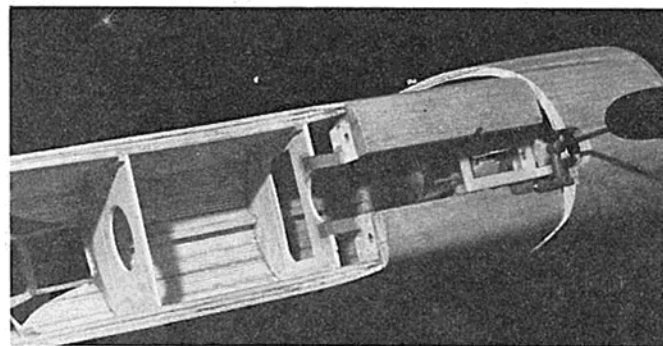
Main Posi-Tract's extended.



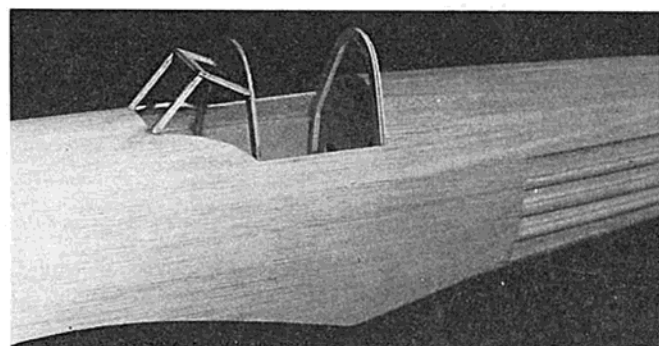
Main gear in retracted position.



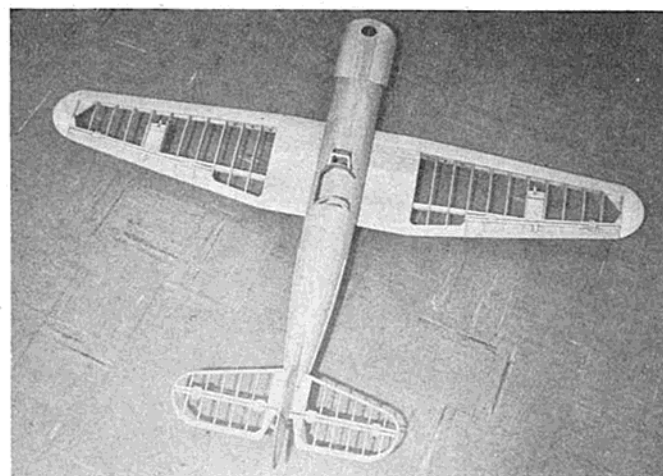
Main Posi-Tract's shown extended and retracted.



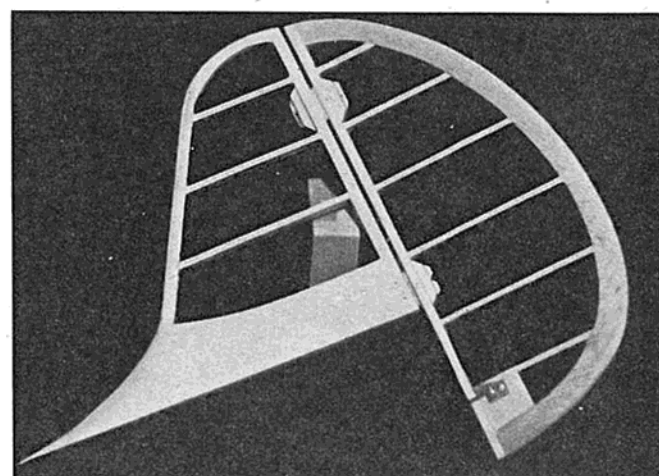
Nose gear and forward interior details.



Clean, functional lines at cabin area.



The YAK-18, ready for covering.



Rudder framework with hinges installed.

Gail Jacobson and Major (to be) Pete Rawlings, and final approval by the "Oracle of NVRC," Joe Taylor, we decided to toss out the vodka bottles (for the Juniors, that's Russian Kool-Aid) and get down to business. I developed the plans from Bjorn Karlstrom's three views and from S. Zurad's drawings which appeared in *Aero Modeller* last fall. Construction is very simple and straightforward; however, a few hints will be provided to help the novice scale builder over the rough spots.

My first consideration was to cut the wing outer panels from styrofoam, but when I mentioned this one evening to Comrade Joe Taylorsky, he shouted "Nyet," and began pounding my drawing board with his shoe. He added he would not tolerate such decadent capitalistic methods as are practiced in the West, and took his pitot heater and went home. In order to keep the Cold War cool, I built the wing in the conventional manner, as shown on the plans. The tapered wing with its 3 degree washout at the tip looks forbidding, but really is quite simple when a tapered block is used along the underside of the ribs to achieve the desired washout while the panels are on the work board. Only the center section and leading edges are covered with sheet balsa. Spruce sub-spars are used in the center section as runners for the Posi-Tract undercarriage units. Should a retractable landing gear not be used, a simple scale gear may be mounted on hardwood grooved blocks in the appropriate position. The ailerons are built up on $\frac{1}{16}$ inch sheet balsa cut to outline and sanded to shape. I used Rand hinges which have proved to be excellent. The servo box may be installed as required in the center section and push rods, linkage, and bell cranks are conventional. If desired, the speed brake, or flap, may be installed very easily as shown on the plans and actuated with an additional servo. This servo may also be linked with the Posi-Tract landing gear switcher to accomplish both tasks, however, we preferred to use another unit for this function. The wing is mounted to the fuselage with pegs at the leading edge and two $\frac{3}{16}$ inch nylon shear bolts at the rear.

The tail members are simple framework, well glued, and sanded to airfoil section. I used $\frac{1}{4} \times \frac{1}{2}$ inch spruce for the stabilizer spar and would recommend that this material also be used for the rear spar on the fin as well. Since the airfoil on the tail members is rather deep, and the framework quite sturdy, no tendency to warp should be experienced. Glue the fin and stabilizer permanently to the fuselage with no incidence or offset.

The YAK fuselage is probably more simple to build than most Class III models and the side planking and stringers over the sheet side provides exceptional strength. The bottom of the fuselage ahead of the wing is made from soft block balsa recessed

to receive the nose gear in the retracted position. There is ample room for the retraction unit as well as any and all desired radio equipment and power packs. Since these compartments are generous and long, no problem whatsoever should be encountered in obtaining proper balance of the model. The canopy is built from a simple frame and clear sheet plastic. The portion just above the windshield which contains a compound curve may be cut from a moulded commercial canopy. This may also be used for the rear section if desired. The cowling may be built by several methods such as fiberglass, balsa block, etc. I selected the latter and it proved to be quite simple and satisfactory. For the cooling shutters in the nose, construct from a disc of light aluminum to resemble the impeller used on a ducted fan system. Since this unit does not rotate with the propeller, balance is not critical.

Cover the entire model with silk and use white as a base color with red trim and black details. Our color scheme was copied from the aircraft displayed at the Paris Air Show last summer and shown on page 19 of the November 1967 issue of *Sport Flying*.

Test flying the model is purely conventional and if proper balance and alignment is obtained, it will be a real dream, and capable of competing not only in scale, but pattern events as well.

Good luck with your YAK and have funsky.

Completed stab and elevator with hinges installed.

