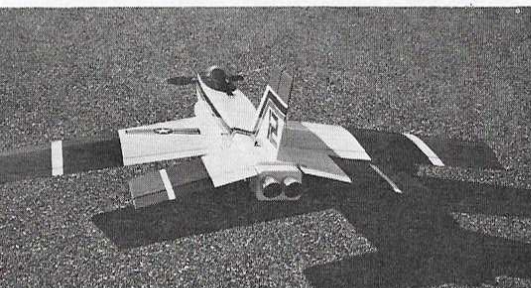


The Esprit on its way home, power on, heading true and straight for the runway. Note wing tip skids beneath each of the wing tips.

ESPRIT

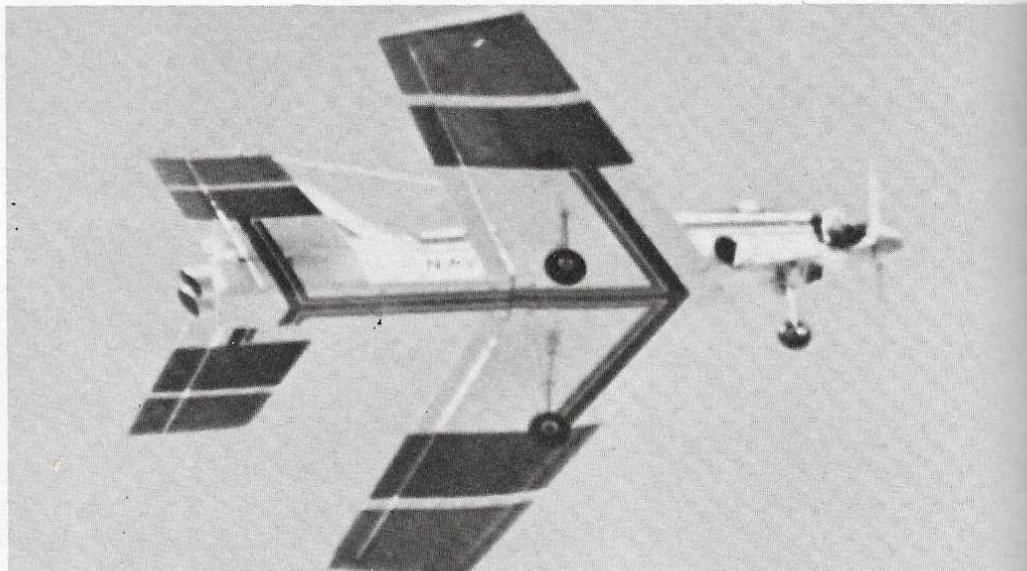


It does have that military look of a fighter!

• To properly understand the significance of the Esprit, one should view it as the concrete expression of a concept, as much as a specific aircraft design. Detailed information on its construction and performance will be presented in appropriate depth in this article, but before we become involved in the nuts and bolts of the machine itself, I feel that it is worthwhile to discuss the somewhat intangible motivation behind the development of the actual hardware.

The Esprit is really a personal expression of that unique phenomenon we encompass with the word "flight." Flight, for those of us who are sensitive to its broader scope of meaning, is much more than the simple ability to physically move in three dimensions without our usual solid link to earth. Flight stands as a symbol of freedom. It implies precise control. It conveys unlimited, uninhibited, wild, free-wheel-

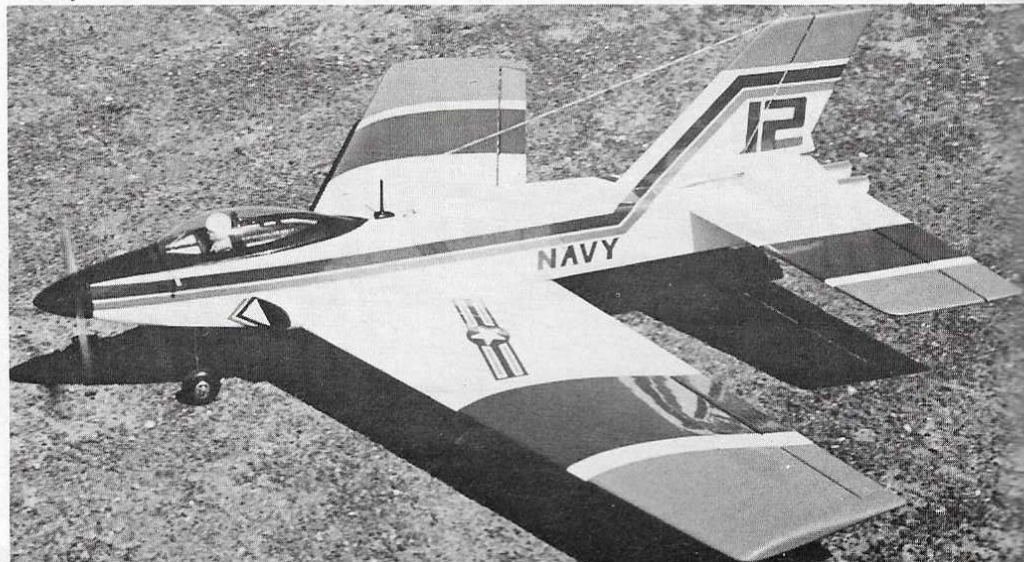
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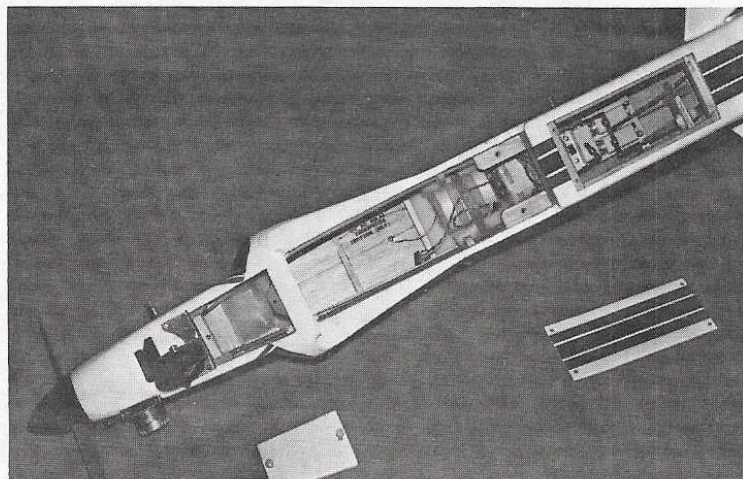
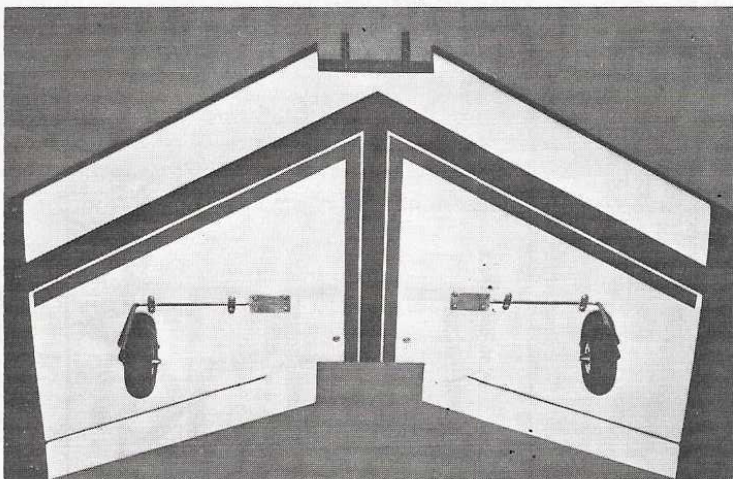
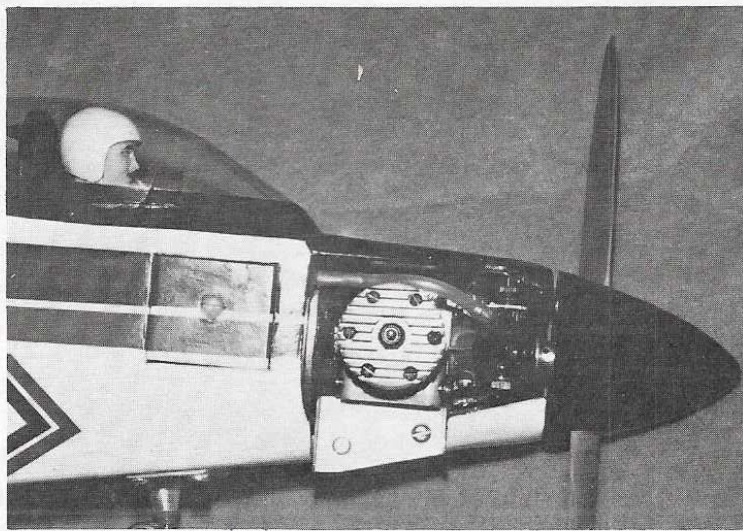
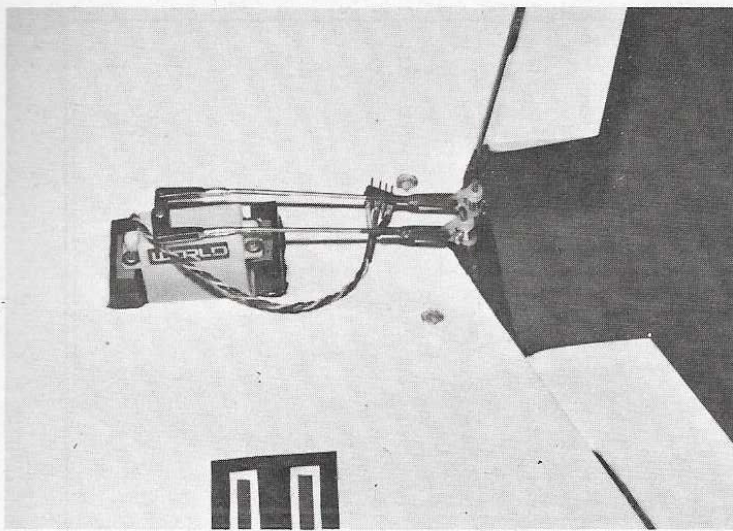


Another view, from down under, of the Esprit on its way home, gear fixed and ready.

BY VAN TWELVES . . . Our author, famous for his Screaming Eagle pattern design, featured in our July 1976 issue, has done it once again, with this different, almost military, also jet-type, fighting aircraft!

Paint job and trim add considerably to military impression of all-out efficiency.





Four photos above show some of the assembly details for the Esprit, including the radio system installation—lots of room in fuselage!

ESPRIT . . . CONTINUED

ing, mind-blowing, exciting, "stand up and shout" feelings. Flight, in and of itself, is an art form that allows the expression of those special thoughts and responses that would otherwise go untold. As a medium of art, "flight" defines a whole spectrum of beauty.

The inherent physical beauty of the machines of flight is found in their lenticular shapes, subtle contours, carefully chosen colors and trim, gleaming finishes, minute detailing, and patient, caring craftsmanship. Dynamic loveliness is expressed by sleek, gleaming little vessels screaming through the sky, with a freedom and grace unknown to the earthbound. The excellence of controlled agility is convincingly conveyed through twisting paths written in the sky: vertical rolls, sustained until the fragile craft is brought to a slow-motion halt by the invincible grasp of gravity; loops, spins and rolls that generate dazzling flashes of reflected sunlight; intricate top hats and reverse Cuban eights that seem the essence of perfection to the casual observer, but are never completely satisfactory to the pilot.

For me, at least, the Esprit embodies those elusive qualities that can never be touched, yet can surely be felt. It is signifi-

cant, I think, that the Esprit was built from a mental image rather than a predetermined plan: Apart from the basic restrictions imposed by the functional demands of stability, no formal plans were drawn until after the bird was completed. The essence of the aircraft grew from a variety of sketches on note pads and doodlings on scratch paper.

I wanted a swept wing on this bird because I had never built a swept wing. I wanted a swept wing because I like the racy, eager, hot-to-go image that a swept wing creates. I wanted a swept wing because I relate to the straining, surging, swashbuckling feeling of sheer motion that a sleek, swept-back jet in a tight pylon turn arouses. And so, because I wanted a swept wing (not too surprisingly!), that's the way this little bird was built.

Like nearly everyone else, I need something fresh and new every once in a while, to keep things from growing stale. A cute little jet that would fly as well as it looked was what I had in mind, when first I started sketching the Esprit. Since it's not always possible to translate a needle-like design into a red-hot pattern bird, I must confess that I had to make more than one concession to function at the expense of

aesthetics. The object of the effort is, after all, not just to construct a flying machine, but a good flying machine. Nobody likes a "dog," and care must be taken to insure that the time and effort put into this or any other project will not be wasted because of ignorance or neglect. I won't relate all the considerations that went into establishing the areas and moments for this bird, because they are only a means to an end, and besides, no one ever reads equations, anyway. What is important is the bottom line. Does the bird really fly, or does it just kind of fly? In this particular case, the bird really "turns on" when the wheels leave the ground!

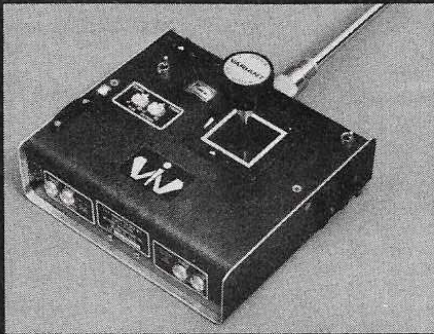
Since swept wings are not exactly famous for good pattern flying characteristics, and since squared-off aft fuselage ends do not normally lend themselves to smooth air flow, a little explanation is due.

The tendency of the nose to drop off in a roll that is usually associated with a swept wing has been literally eliminated by utilizing several techniques. The lifting body effect of the wide fuselage, the anhedral in the horizontal stabilizer, and the extra large surface areas of the empennage, all compensate for the long nose

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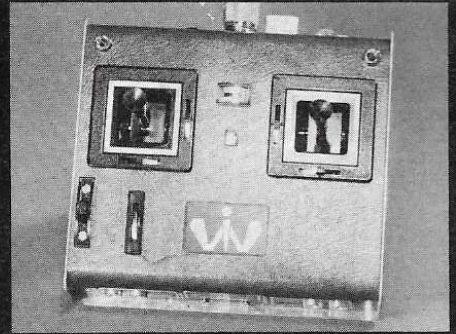


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Esprit

(Continued from page 36)

moment with respect to the aft center of pressure on the swept wing. The result of all this is a very nice axial roll. The semi-symmetrical airfoil was selected to slow the landings down from Mach 1 nightmares to something that we average bear types can handle without losing our minds.

There is, unfortunately, no way that the aft end of the fuselage is not going to create a degree of drag. The beveled twin exhaust stacks do, however, provide a phased step-down in cross sectional area, which attenuates the abrupt ending considerably. The configuration of the exhaust stacks and the fact that the maximum experienced airstream velocity is not excessively high (70 to 90 mph) for .40-powered pattern ships, allows this format to be used without adverse performance degradation. There is no dancing, buffeting, or flutter, even in a wide open vertical dive. The Esprit is rock-steady throughout its envelope.

Coupled with the aesthetic image I wanted to achieve in the Esprit was the desire for an airplane that is fast and easy to build. As long as we are optimizing appearance and performance, we might as well go after fabrication and cost, too! The Esprit is, literally, a "cinch" to build. The foam core wing, box-like fuselage, and solid sheet empennage construction features add up to a very easy to build aircraft. Undoubtedly, the most difficult task in building the Esprit is carving the air-scoops and exhaust stacks. If you happen to have a knife, then even the carving is easy, so don't let lack of building experience inhibit you in the least with this model.

WING. It is important to note that the root and tip sections presented in the plans are taken perpendicular to the trailing edge of the

wing. The overall length of one wing panel along the trailing edge will be 30½" when cut, but 3⅞" will be removed from the trailing edge of each wing panel when the wedge-shaped piece allowing for the sweep is removed from the wing root. The actual airfoil presented to the airstream is, therefore, elongated by 5.52 percent, when compared to the section drawn in the plans. The airfoil templates are presented as they are, simply to make the setup for cutting the cores easier to accomplish.

With the hardwood block in the leading edge and the plywood brace in front of the landing gear, it is not necessary for you, I believe, to glass the center of the wing. If you like to wrap wing joints, feel free to do so, but bear in mind that over-building adds nothing to performance. The entire wing is sheeted with ¼" balsa, and that basically describes the wing. As your preference dictates, the wing tips may be squared to the line of flight. The only other thing to be aware of is that, with the swept trailing edge, the plane of rotation for the aileron horns will not be parallel. This is not a problem if care is taken to insure that the linkage to the horns is free to rotate in two planes. If this precaution is not taken the first time you crank the aileron servo back and forth, be prepared for some interesting noises.

FUSELAGE. This is the way all fuselages ought to be designed: cavernous. Basically, the plans show it all. Install the ¼" plywood doublers, bracing, and balsa longerons on the sides before joining the sides with the bulkheads and firewall. The plans show a firewall-mounted nose wheel where I used a belly-mounted unit. I just happened to have an ancient belly-mount unit laying around when I built the plane, so I used it, rather than buying something new. Since firewall mounts are more available and are easier to work with, I

illustrated that system in the plans. Any old nose wheel will work just fine. I also used a cut-down canopy from a Sig Komander that I had but, once again, there is nothing sacred about this. Any canopy of a similar configuration will do the job nicely.

The exhaust stacks and air scoops are carved from balsa and hollowed out, to keep the weight down. The exhaust stacks are covered with chrome MonoKote to simulate a metallic tube. The length and diameter of the exhaust stacks should be carefully reproduced, because they are sized to attenuate the drag that the abrupt aft end induces. Actually, making them longer with more taper is O.K., but making them shorter is not recommended.

EMPENNAGE. The tail surfaces are all made from medium-hard ¼" balsa sheet, with the leading edges rounded to a full radius. The moving surfaces are tapered, as the plans illustrate. The linkage for the elevator is accomplished with two independent Nyrods linked to the same servo output. A nice feature that comes with independent elevators is that a small degree of roll trim may be trimmed in the elevators, if desired.

FINISHING. I used Super MonoKote to finish the Esprit because I have always had consistently good results with it. Any finishing method that a builder prefers is perfectly acceptable.

FLYING. Make sure the center of gravity is where it should be, and light the fire. I suppose that, if I were hard pressed, I would have to admit that the Esprit just flies like a regular good old pattern bird should, but it looks so much *neater* that my perception is severely biased! The swept wing and tail with the rather massive fuselage create a brand-new flavor that can only be described as "fun." Pulling up from the downhill side of a

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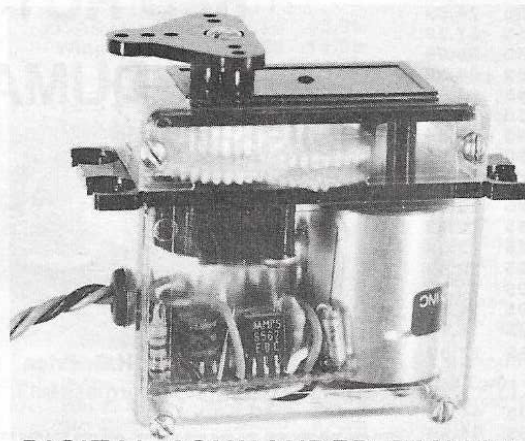
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Esprit

(Continued from page 67)

loop or making low, fast pylon turns is twice the fun it used to be, because the bird looks like it is just slicing through the air! The sensitivity of the machine will depend, of course, on how the control throws are set up, but I think that the term "responsive" accurately describes its handling characteristics. A considerable amount of lift is created by the lifting body effect of the wide fuselage, which aids in keeping the takeoff rolls short and the landings tame. All the troops at the flying field have expressed nothing but sheer delight with the way it flies, so if consensus of opinion means anything, the Esprit is definitely a winner!

CONCLUSION. As stated before, the Esprit should be viewed as merely one man's expression of the creative drive in all of us. If you like the plane and it says what you want to say, then build it! It flies great. You won't be disappointed. If it almost, but not quite, says it for you, then modify it, customize it, and individualize it. If it doesn't even begin to relate to you, then ignore the aircraft, but remember the concept: "Esprit" to me means "free spirit." ■