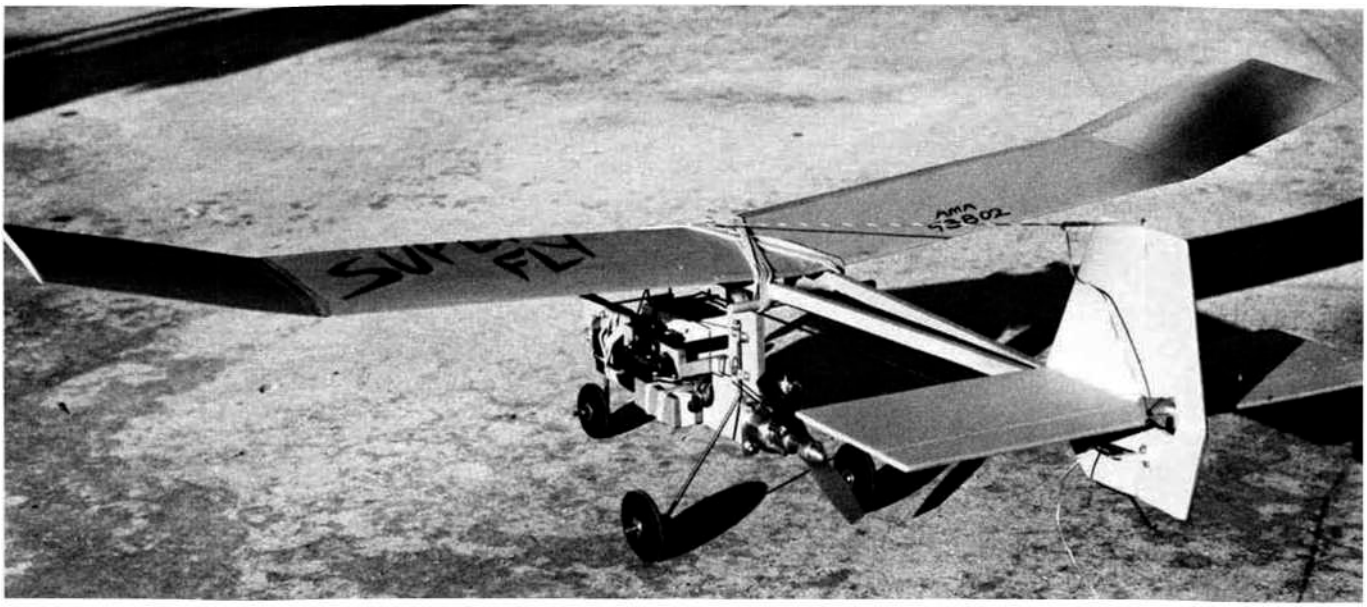


One thing sure . . . you can't say that LIAHO is just another 3-wheeled look-alike! It can be built in a few evenings . . . without plastic yet!

L.I.A.H.O.

TEXT BY BILL NORTHROP

Literally a flying showcase for radio control systems, this inside-out, .049 powered model can be completely assembled in just a few evenings. What does LIAHO mean? See the text. By ROBERT JANIGER

How many times have you attended a trade show and seen a carefully constructed mock-up of an airplane, designed primarily for the purpose of displaying a radio control system? The receiver, battery pack and servos are all invariably mounted in plain sight so that you can see the whole airborned package.. and for the benefit and amazement of the uninitiated, all of the linkage is exposed so that its operation may be watched.

And how many times have you jokingly remarked to whomever it may concern, "very nice . . . but it'll never fly!"?

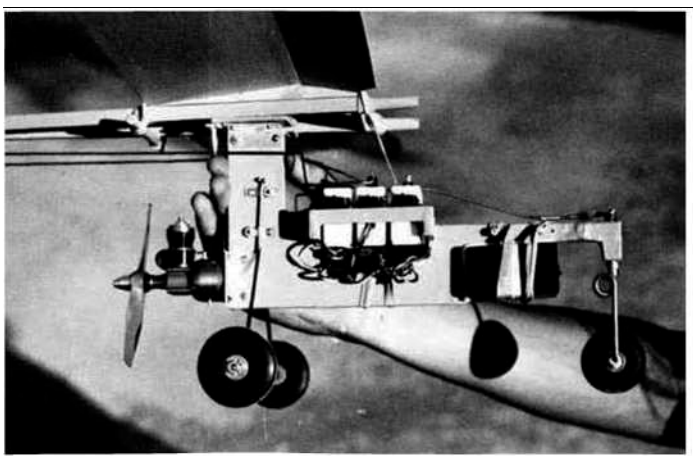
Well, ladies and gentlemen, as of now, the shoe is on the other foot - - - or should we say, the wheel is on the other strut ... for in the LIAHO we have a flying R/C showcase.

Actually, the original intent in creating the LIAHO was not to display R/C gear, but rather, to come up with . . . here comes that phrase again ... a quick and dirty model that could be built and become airborne in the least amount of time. The result is somewhat reminiscent of the Breezy J r., a currently popular homebuilt which is often seen at fly-ins. The Breezy is a trikegeared, high-wing monoplane, pusher configuration which is usually built from a pair of existing lightplane wings, simple tube-framed and canvas covered tail surfaces, and an uncovered, welded steel tubing fuselage. The pilot and passenger seats, instruments, controls, et al, sit out in the open . . . ahead of the wing ... on top of the fuselage frame work, rather than within. The name Breezy is hardly inappropriate.

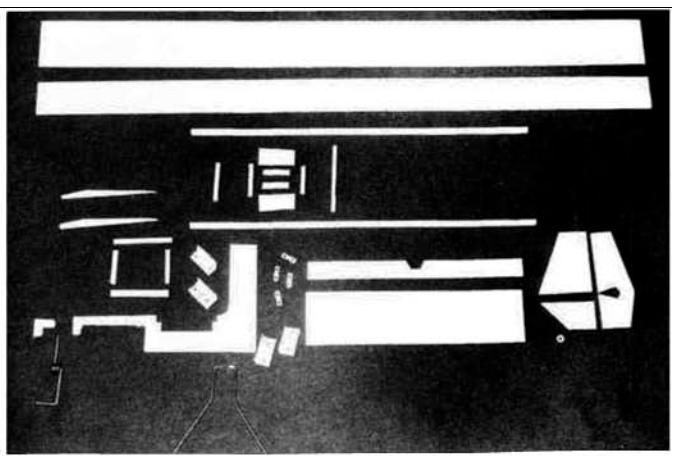
In spite of first appearances, LIAHO is not a beginner's airplane to fly. With a wing loading in the neighborhood of 17-3/4 oz. /sq. ft. the flight speed is relatively high, and control reactions are quick, though precise. The two prototypes have been flying with Cox .049 Golden Bee's, using Hot Fuel and 5x3 props . . . with which performance is adequate. A Tee Dee .049 or .051 with left-hand pusher prop would make it a more lively machine.

Takeoffs can be made very realistic, since LIAHO will rotate on the main gear before flying speed is reached. Shooting touch-and-go's from the local parking lot could make you late for dinner most any evening. If this particular maneuver is your bag, we'd recommend raising the thrust/line as much as possible since it's easy to tick the prop during rotation.

Those with 2-channel radios, "brick" style or no, should enjoy LIAHO.
Just forget the throttle . . . flights only



Fuselage pod (?) is a piece of 5-7 ply plywood, to which most everything is attached. Vary servo cut-out to suit your radio. Simple.



This picture of all the parts pretty well tells the story of the simplicity of construction. With 5-minute epoxy, one evening could do it.

average 3 to 4 minutes anyhow. On the other end of the ledger, using 4 channels and including ailerons (on the inboard panels only ... or forget the polyhedral and run “strips" all the way out) would not be difficult . . . And one could always take advantage of 48 inch sheet stock and go for more wing span (also a little more tail area), thus reducing wing loading . . . and flying speed ... Or simply enlarge the whole thing by 1-1/3 and tack on an .09 . . . etc., etc.

Oh ... By the way . . . That word LIAHO. The designer, Bob Janiger had originally named his creation the “Mosquito”, and the second prototype “Super Fly". However, almost at first glance, ye editor came up with LIAHO, and Bob was quick to agree . . . LIAHO is the initials for “Let It All Hang Out!”

CONSTRUCTION

LIAHO is simple to build, and with all materials handy, shouldn’t take more than a couple of evenings. . . depending on the finish to be used.

FUSELAGE

When cutting out the main 1/4 inch plywood crutch, determine the size and shape of your servo tray installation before making the cut in that area. Note that the crutch extends to the top edge of the spruce booms. Be sure to smear epoxy in the areas shown on the plans for extra reinforcing.

The wing and motor mount brackets may be bent from sheet aluminum obtained at your hobby shop or you can use 3/4 inch aluminum angle, which is available from many hardware or building supply shops.

An alternate to drilling a hole for the brass tube nose gear bearing would be to epoxy the tube to the front of the fuselage crutch and then wrap the sheet aluminum cap around the tube, filling all gaps with epoxy.

In order to maintain proper alignment the tail-boom framework should be built over the top view. Five-minute epoxy is used throughout the construction.

TAIL SURFACES

Cut ’em out, sand ’em, hinge ’em, and stick ’em in place . .. straight, that is.

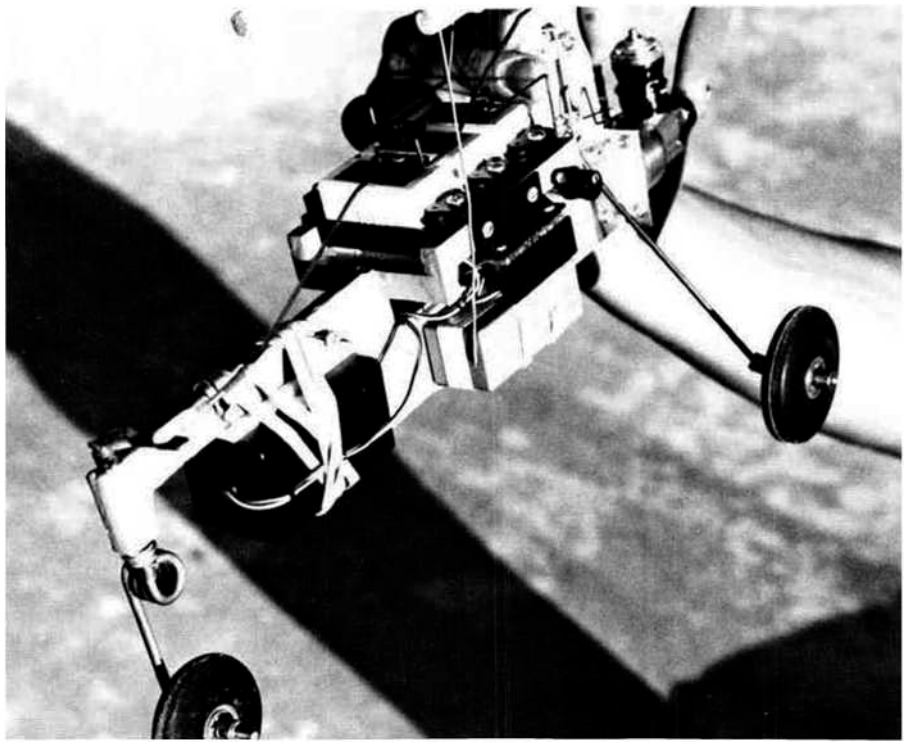
WING

This’ll be about the fastest building balsawing for an R/C model that you’ve evertackled.

If it hurts your pride to fill a big gap with epoxy rather than beveling the two wing sheets, go a- head . . . we’ll wait. . . Hmmmmmmmm mmmmmmm. OK? e

If you have no pride, or you’re in a hurry ... or both, simply run a piece of masking tape the full length of the underside of the butt (?) joint, lay it over a jig-strip of 1/4 by 3/8 (see? If you read all the instructions first, you’d save yourself the expense of buying a jig-strip. You build the wing before building the fuselage, and use one of the strips of 1/4 x 3/8 spruce tail-boom stock for a jig!) and pour in the epoxy. If you’re using 5-minute stuff,

With pusher arrangement, fuel or exhaust is not likely to get into radio gear, unless engine happens to start up backwards! Note music wire pushrod guides made from control horns.



With everything hanging outside, switch could just as well be eliminated. Simply connect battery directly to receiver when you're ready to fly. Radio is air-cooled RS Systems, with LDR-2 servos.

LIAHO's surfaces are all sheet balsa. Wing is Jedelsky type, but uses only two ribs at the center section. Two-channel brick radio can be used without throttle.

LIAHO..... ***Continued from page 22***
you better do it in small batches.

Once the epoxy is cured, you cut the wing in four pieces, bevel for dihedral, and glue the panels together.. . same as you'd assemble a hand-launch glider wing. Reinforce the center dihedral joint with a strip of linen smeared with epoxy.

Don't bypass that piece of reinforcing wire on the trailing edge. It won't take those hold-down rubber bands too long to chew through the wing at that point.

FINISH

The prototype was sanded smooth with No. 320 wet-or-dry then given 5 sprayed coats of dope mixed 60% dope- 40% thinner and sanded between each coat. Though the flying surfaces could be monokoted, the fuselage and booms could not, so you might as well pass on this one and do the whole thing in dope.

EQUIPMENT MOUNTING

Being an "inside out" type of model, radio installation is a relative snap. Servos should be wood-screw mounted directly to the spruce frame, or indirectly mounted with a servo tray. Battery pack and receiver are double-stick form taped in place PLUS rubber banding. A D&R switch mount provides the best method of installing this item.

The photos tell most of the story. Control horns mounted on the wing saddle act as fairleads for the 1/16 music wire pushrods for rudder and elevator. Use 1/32 wire, with a kink for length adjustment, in a direct shot from throttle servo to baffle.

FLYING

We talked about this in the beginning. Also note that contrary to the usual, rudder becomes more effective with a snitch of up elevator.

If you hand-launch, keep in mind that the prop is *behind* the holding area. Like the name says, it's *all* hanging out, so git your mitt out a there quick!