

Smiling author, well-known Connecticut single channel flyer, poses proudly with his completed project—it's good looking as anyone can plainly see.

► Bill Northrop's Field and Bench in the September issue clearly stated and outlined the problems of presenting product reports without being redundant. It's impossible, they must all be pretty much the same. They must touch all the same bases before you are home free, and free it isn't, as all have the same beginning and while not necessarily the same ending, most will be in the same ball park or its immediate area. Let's

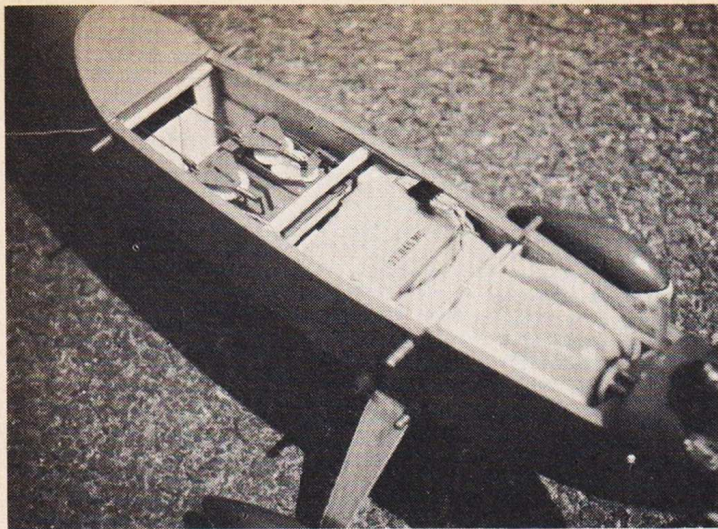
face it, today's products are sophisticated, well-packaged items that produce the same results; good flying units. Working only in the area of single-channel, delving into "Galloping-Ghost," I felt that the Top Dawg plane coupled with Rand's new DUAL TAC system presented something new with a possibility of a challenging report. This was the furthest from fact that I have been in a long time, kit was good, electronics

worked and what else is required. So now how to report and be different, only approach was a factual step-by-step of the whole ball of wax with annotations in those areas I felt could stand explaining or clarification.

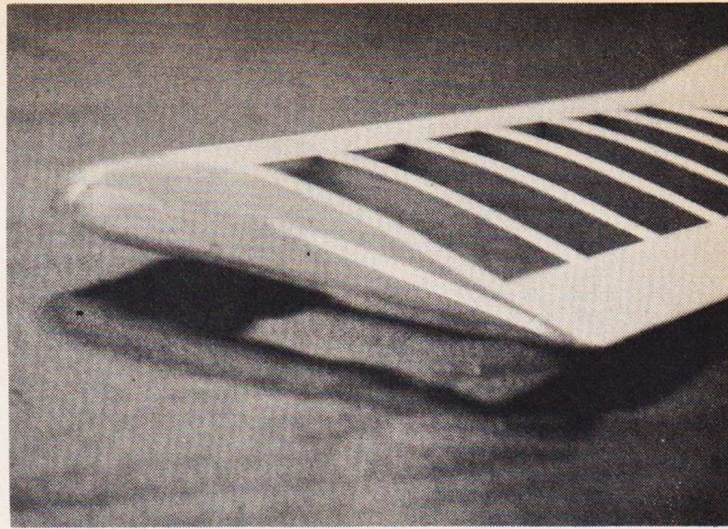
Hope this is as exciting to you as it was when I received from Walt Schroder Top Flite's Top Dawg kit still wrapped in its airmail finery. Very impressed upon opening the box as

FIELD AND BENCH

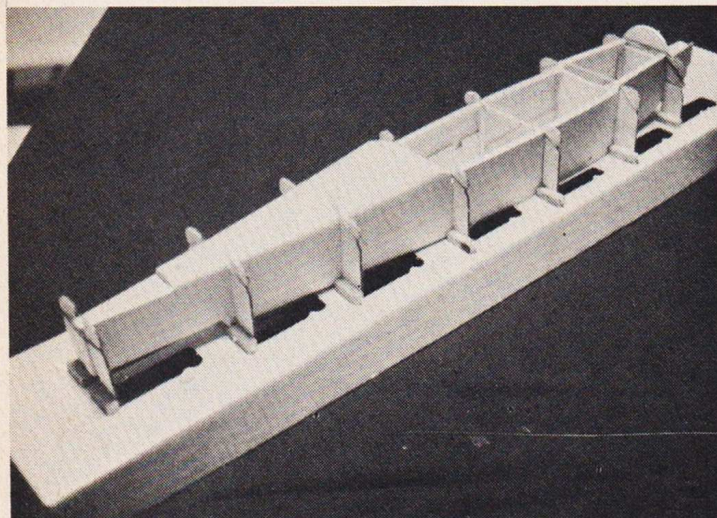
TOP FLITE'S TOP DAWG KIT, ENYA .09 ENGINE AND RAND'S DUAL TAC SYSTEM WITH CONTROLAIRE TRANSMITTER AND SH-100 RECEIVER. . . . A factual report on the building or constructing of the Top Dawg kit, installation of the newest Rand product (rudder, elevator, motor) and the field testing and flying of the fully integrated package . . . By BERT STOUDERT



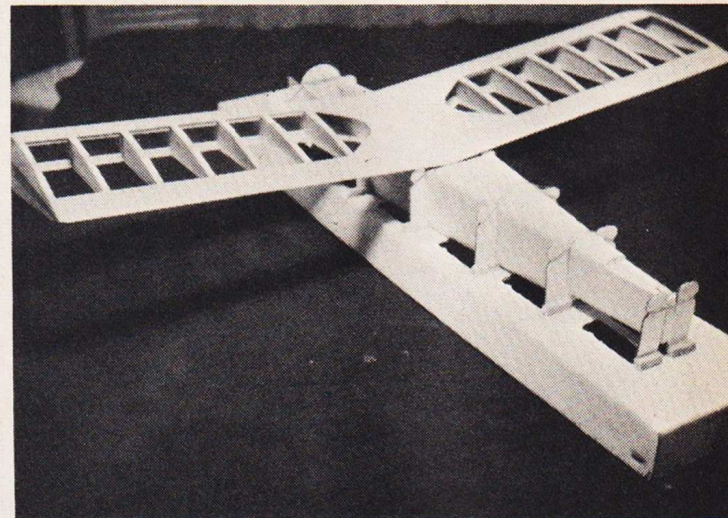
Compact but with plenty of room, actuators are side by side with rudder/elevator pushrods to rear and throttle linkage against fuselage side.



Formed, transparent plastic wing tip is installed prior to covering. Follow painting instructions in text to prevent deforming the plastic.



Author heartily agrees with Top Flite's claims for their fuselage construction jig—follow instructions on the box for perfect fuselage alignment.



Top Flite's construction jig has a two-fold purpose. Guarantees squareness and also can be used to check for correct alignment of surfaces.

FIELD AND BENCH...

it was neatly packed. A quick look showed high quality balsa, clean die cutting, a lot of hardware (including bolts, nuts, control horns, tail wheel bracket, formed plastic wing tips, canopy) and plans that looked complete and easy to read.

After another good look at the plans to familiarize myself with the steps and procedures, decided to lay down the fuselage sides, one left and one right, and framed each with 3/16" sq. balsa.

Next step was to set up the fuselage assembly fixture which is made from the bottom of the kit box. All that is required is to push all the die cut supports down and glue at 90° using 3/16" sq. balsa (which is provided). Set-up is simple, just follow instructions.

While the fuselage sides and fuselage fixture are drying, punch out all the die cut parts. For the most part, the die cutting was very good. In some places, the trusty X-acto pen had to be used.

When the fuselage sides are dried, slip them into the fixture bottom side up as

shown. Add formers and cross supports. Fixture really holds fuselage snug. Add all bottom balsa sheet using pins and elastic bands as shown. Set fuselage aside to dry.

Next, assemble stab, which goes rather quickly since it is balsa-covered top and bottom with internal ribbing. Also glue together balsa rudder (only 3 pieces) the trick here is to let stab and rudder dry thoroughly before removing from board to eliminate warping.

Next step is to slip fuselage out of fixture. Encountered a little trouble here due to a couple of glue spots. Suggest using wax paper under fuselage. Put fuselage back in fixture right side up and add rear formers and stringers for turtle deck. Also add firewall and cross braces. The fixture is quite an innovation, now I know why it is called T.A.C. (True Alignment Construction). It really works.

Wing—Lay down leading and trailing edge sheets. Spars are slightly long and notches slightly off. Just relocate a couple of notches. Set ribs, cap strips,

etc., as shown on plans. Dihedral braces a little too thin, make new one from 1/8" balsa sheet.

After first wing panel is dried, remove from board and build second panel similar to first. Cap strip material a little shy so cut some strips from 1/16" scrap sheet. Join the two wing halves together with correct dihedral and put aside to dry, cut out plastic wing tips and try for size. Probably will have to cut trailing edge away slightly in order to fit tips.

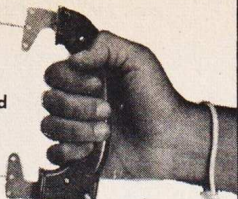
After wing is dried, place it on fuselage with elastic bands and add formers front and rear for turtle decking. Also add formers for front hatch. This method assures good alignment of fuselage, wing and front hatch formers and supports.

Next step is to cover all turtle decking with balsa sheet. The balsa sheeting is purposely oversized so it takes a little time and patience to get good joints. A little helpful trick is to wet the balsa on one side. Then it is just a matter of gluing and

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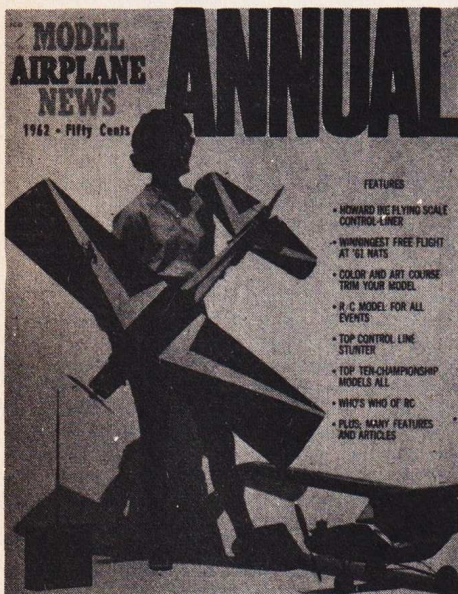
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Field and Bench

pinning in place.

While waiting for turtle decking to dry, add noseblock and hardwood motor mounts, with blind nuts installed. After trimming noseblock to shape, sand all finished assemblies (fuselage, wing, stab and rudder).

Next assemble wheel pants per plans gluing pieces together making sure to end up with one right hand and one left hand. When dry rough out to shape with wood rasp and finish smooth with sand paper.

Decided to cover Top Dawg with red Silron except for rudder and wheel pants. The latter were painted with Red Aero-Gloss. Rudder, wing, stab and pants were trimmed with white Aero-Gloss and striped with 1/8" black strips. Then add five coats of clear Aero-Gloss dope to all assemblies to seal against fuel and to give shiny finish. The clear wing tips were sprayed with Red plastic paint (Testor's Pla) since we couldn't locate any Testor's TCL lacquer. When tips are dried, glue in place with Sig's cement (a clear cement). An Enya .09 was used for power with 1/8" laminated phenolic motor mount. Had to notch out motor mounts to clear engine screws.

While mounting wheel pants to landing gear, found that screws provided were too short, had to use longer ones. Also added tailwheel support.

Put the finished pieces together to see what kind of an airplane we had. Have to admit it looked real sharp. Total building time so far about 40 hours.

The RC equipment used in the Top Dawg is the new Rand DUAL TAC system by Herb Abrams. (See Rand advertisement this issue.) Transmitter used was the Controlaire GG, (it's beautiful). Receiver used was the Controlaire SH-100 with relay removed. The whole system developed specifically for this type of operation

but we were fortunate enough to have the system check and aligned by Herb Abrams (including Tx and Rx). (Ed's note: Herb and I were at the World Engine's Open House when we decided on this project and Paul Benkner picked the Controilaire equipment off the shelf—because he was there it was decided that Herb would do the alignment of the transmitter/receiver to the actuators and then send it on to us.

We tell you this so that you understand that it is only by a fortuitous circumstance that Herb Abrams was on hand to do this favor. He certainly is not available to do this as a regular practice, just doesn't have the time.) System was received all pre-wired with switch, connectors and 3.6 V .6 amp Nicad power pack. The DUAL TAC is a single-channel pulse proportional rig. It consists of two separate servos with built-in switcher and decoder. One servo gives pulsing proportional rudder and trimmable throttle, and the other servo gives pulsing proportional elevator. Rudder and elevator are simultaneous. When trimmable throttle is used, both rudder and elevator cycle thru to give neutral surfaces.

Servo board was made 1/16" thick laminated phenolic and servos were bolted directly to board. Servos are bolted to hardwood cross rail in Top Dawg using four rudder grommets as shock-mounts. Make up control push rods of 1/4" sq. balsa. On control surface end use Kwik-Link connected to control horn, (this makes for easy field adjustments). At servo end, use Rand's new swing-in keeper (very neat and foolproof installation).

Add two-ounce fuel tank up front under hatch and flex cable for throttle control. Attach Nylon Ny-Link to engine throttle and use Rand Swing-in keeper at the servo. Put battery pack under fuel tank, wrapping securely in sponge rubber. Add receiver (also wrapped in sponge rubber) behind first bulkhead. When all assembled, Top Dawg should balance a little nose down and weigh close to 36 ozs. Total building time about 50 hours.

Slipped 8-4 prop on Enya engine and started it. Turned on system and found everything worked like a charm. Rudder and elevator both had about 15° of throw and engine control was very definite (although a little fast in response).

Gave batteries a full charge and then gave system a life test as follows:

1. Ran system for 12 minutes (with random rudder, elevator and engine control).
2. Shut system down for 30 minutes.
3. Ran system for 12 minutes.
4. Shut down for 30 minutes.
5. Ran system for 12 minutes.
6. Shut down for 30 minutes.
7. Ran system again but after 2 minutes, started to lose elevator and rudder throw. After another minute lost engine control.

This test established that the system is good for three flights of 10-12 minutes duration and then recharging is required. I would suggest that you buy an extra Rand Power Pack as this would give you twice the flight time.

The DUAL TAC system gives you positive control of rudder, elevator and engine at all times. Part of this is due to the fact that since the receiver has no relay, there is no vibration problem. Another fact is that there is separate rudder and elevator servos which are simultaneous with no interaction occurring as in galloping-ghost. As mentioned before, the Rand system is pulse and the control surfaces do wiggle, but at a fast rate (about 10 pps at neutral). Since the rate is fast, the ship does not sense the wiggling control surfaces and flies as smooth as silk.

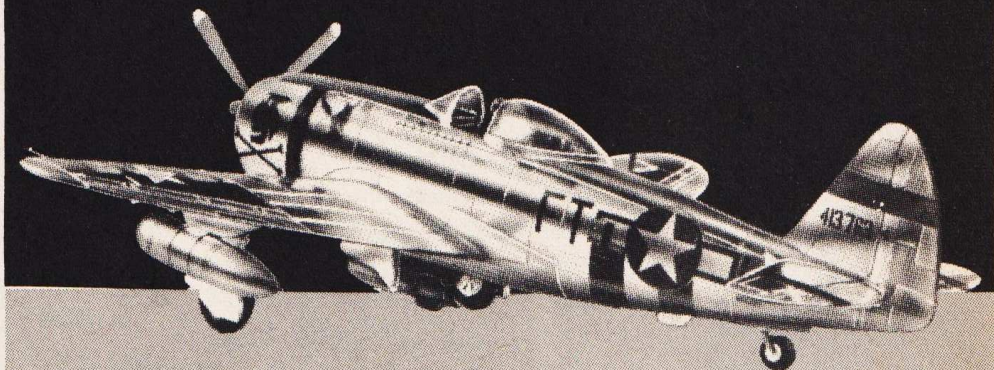
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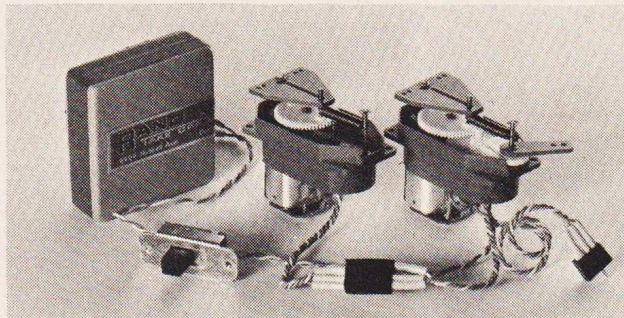
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When the ship is airborne, you can't tell it from the big proportional jobs.

Flight test time finally arrived. The first flight is always the hard one, so we waited for a fairly quiet evening. At the field the Enya .09 fired off on the second flip and sounded real good so decided on an ROG. Our Top Dawg tracked about fifty feet and with a little up elevator lifted off the ground in a very shallow climb and a little right turn. Corrected the turn with trim and just flew around slow and easy. Top Dawg is quite stable and easy to fly. Cut the engine back and the ship just floated down and though a little quick on elevator came in for a nice three point landing. After the usual first flight, nerves settled down, decided to try a second flight. Tried another ROG but the landing gear folded under (found out later needed more rubber bands on gear). Finally hand-launched ship and got in another successful flight. Top Dawg with Rand's system is an unbeatable combination for single channel proportional in a small size plane. (Top Dawg's wing-span is only 39½ inches.)



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