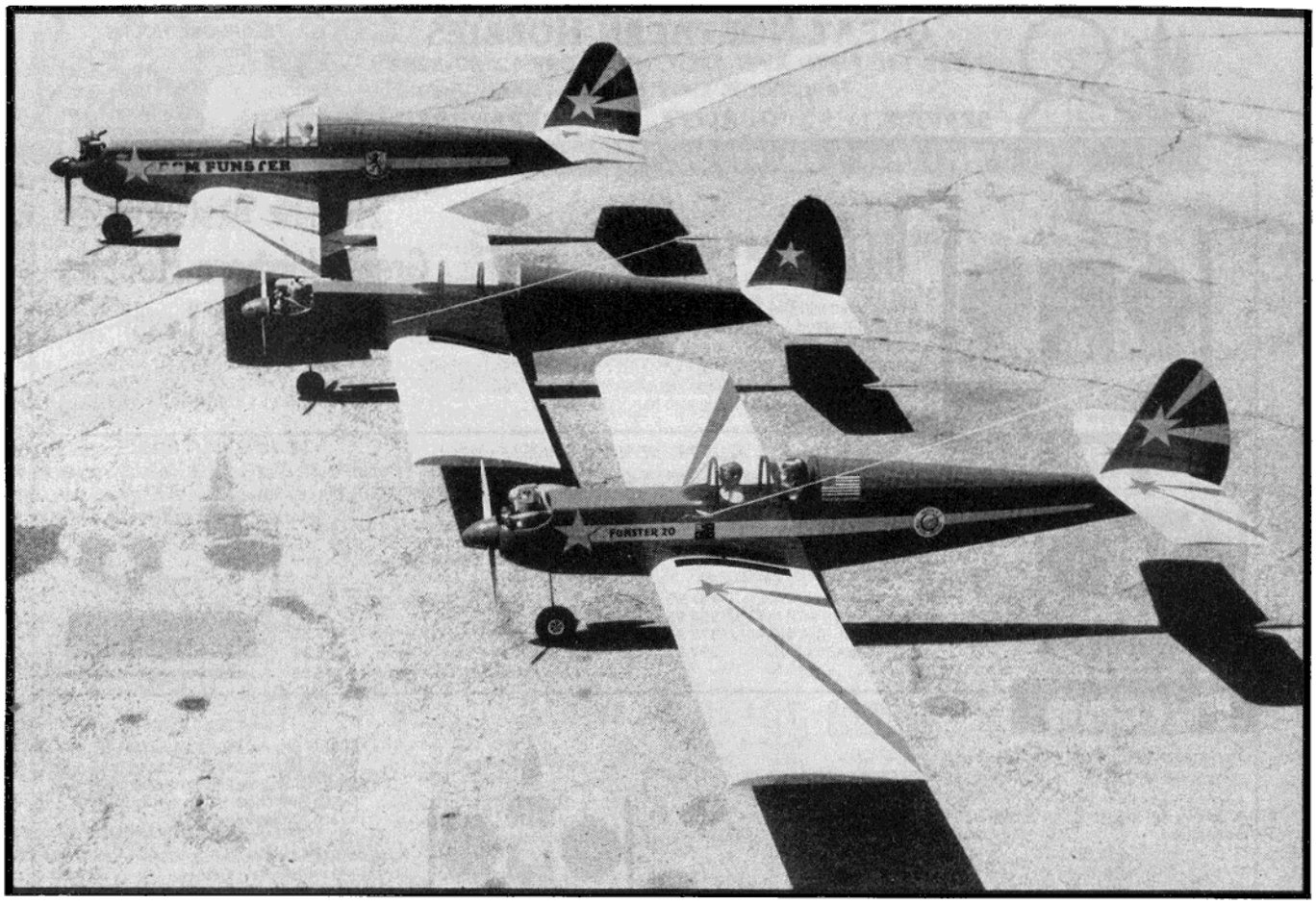


The Funster trio — foreground is the final version of the Funster 20, middle one is prototype test model, and background is Funster 40. This appeared in August '82 and is RCM plan #871 ($10.50).

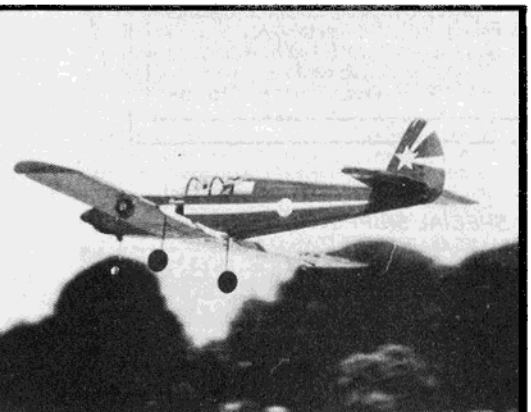
FUNSTER 20

A .20 Powered Sport Design Inspired by the RCM Funster 40

By Dick Tichenor

Some time back, while watching Joe Zdankiewicz's strange and spectacular maneuvers with the RCM Funster 40, Don Dombroski commented, "A .20 size Funster would be nice." Don is pretty slick with his subtle challenges.

The RCM Funster 40 (RCM August 1981, plan #871) is a .60 size airplane with light wing loading and powered with a .40 engine. Now we are considering a .40 size airplane for a .19-.25 size engine while knowing that a straight percentage reduction of the 40 will not give us the same desirable performance. We wanted to retain the Funster concept.



As for the Funster concept, there is nothing new, exotic, or unusual involved. We have simply assembled a combination of features that have been proven over the years to achieve the desired flying characteristics. First, we wanted slow flight capability with good inherent stability and it must be a very tolerant and forgiving aircraft. We also wanted reasonably snappy take-off capability and maneuverability when needed, and large wheels on tricycle gear for good ground handling and to facilitate take-offs and landings on grass fields. The above listed features weren't difficult to put together.

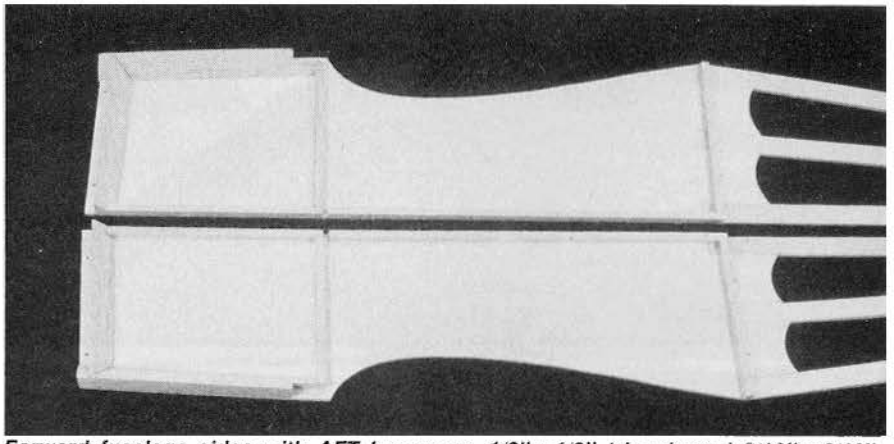
There is another aspect that we feel is most significant, although purely cosmetic --- it must be attractive. Square box type designs are very practical and are already available in many sizes and by the dozen. There are a lot of us who have a lot of pride in our hobby and we enjoy complimentary comments concerning our models from wives, friends, and flying buddies. We feel that this has been achieved with very little effort, especially after listening to the compliments at the flying field.

All of this good performance is attributed to a large aircraft with light wing loading and reasonably low power loading. Other factors contributing are a high lift, low drag wing section, large control surfaces, long tail moment arm, and a lifting horizontal stabilizer.

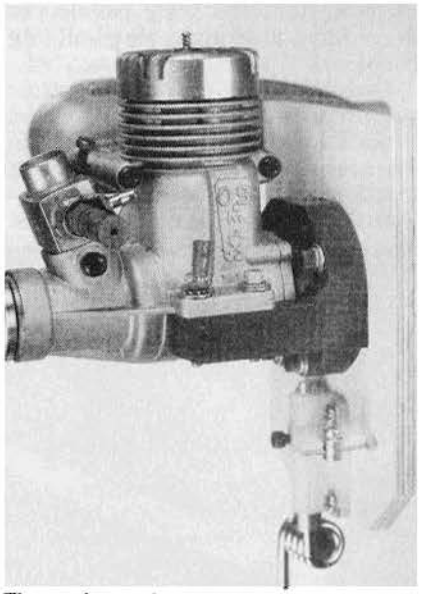
Our scientific calculations (reality: best guesses) were used to design a

Incidentally, we strongly recommend that you install the flaps if you have a 5 channel radio. They aren't really necessary for the Funster, but you sure can have fun with them. If you go for flaps, keep this in mind: when connecting controls between a horizontal rotary arm, or wheel, at the servo, and a Y or fork pushrod to the flap control rods, you will get uneven deployment of the flaps as the servo output rotates. We eliminated this problem by installing the flap servo on its side with the output arm rotating fore and aft in a vertical plane. The connecting pushrod assembly is detailed on the plans.

The horizontal stabilizer has a simple structure with a flat bottom lifting airfoil. The front spar has a uniform depth to simplify the cutting and fitting of the shear webbing. The slots in the top center sheeting facilitates a strong and straight alignment of the fin. Do not cut the spar between these slots.



Forward fuselage sides with AFT longerons, 1/2" x 1/2" triangle and 3/16" x 3/16" reinforcement strips attached. Note: A left and right hand assembly is required.



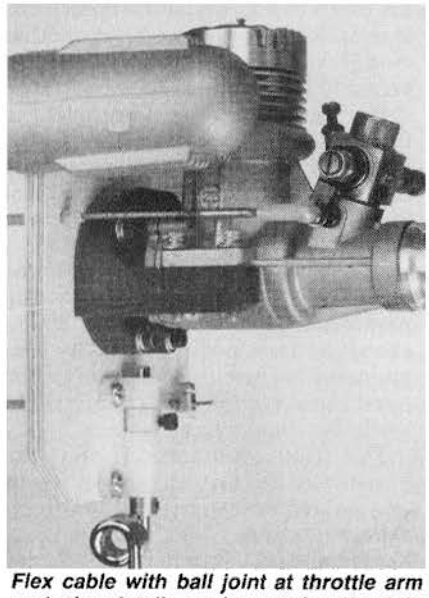
The engine and nose gear are easier to fit to bulkhead 2 prior to assembling fuselage.

The vertical fin and rudder are made from soft 3/16" balsa and are sanded to a streamline cross section. Note that the bottom of the fin extends down into the stab.

The same as everyone else, we have our own approach to building. We prefer to cut out as many parts as practical prior to starting assembly. We usually preassemble the engine mount and engine, nose wheel mount, and steering arm, and the fuel lines to the 1/4" plywood front bulkhead. Then those components are removed and the bulkhead is worked into the fuselage structure. We find it easier to do the drilling, blind nut installation, etc., in this manner.

The structure is about as simple as we could make it and still achieve the desired appearance.

The mouth shaped hole below the spinner sort of resembles a P-51 which is a bit different for a sport aircraft but the reason for it is functional. The opening provides access to the lower engine mount bolts and to the nose wheel mounting bolts.

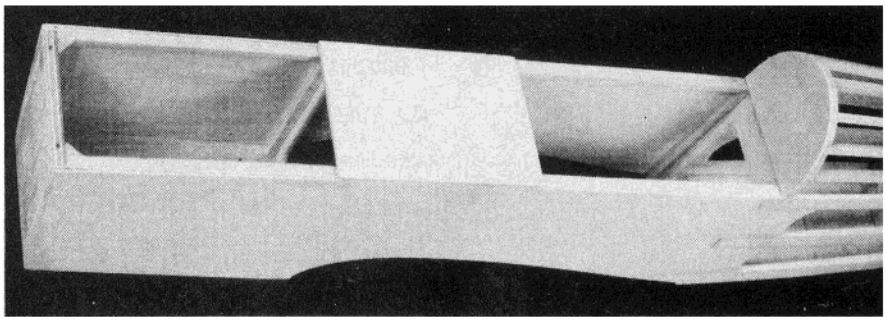


Flex cable with ball joint at throttle arm and other details can be noted on the right side view of bulkhead 2. These components are removed before assembling fuselage.

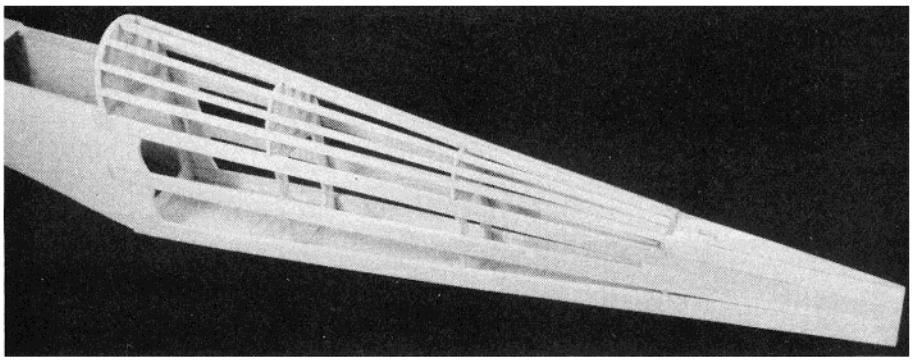
The canopy was made of two pieces of clear butyrate sheet and was installed after the fuselage was covered.

Our Funster 20 was covered with

The 1/8" ply plate was temporarily tack glued on top of fuselage to assure straightness and squareness of fuselage assembly.

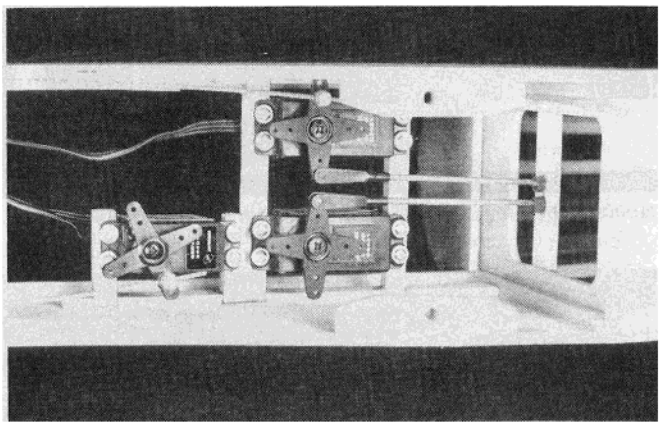


red and yellow MonoKote and the same was used for trim. An old but little known trick was used for applying the trim. With the trim pieces cut out and ready to apply, spray a light coat of Windex on the covering where the trim is to be

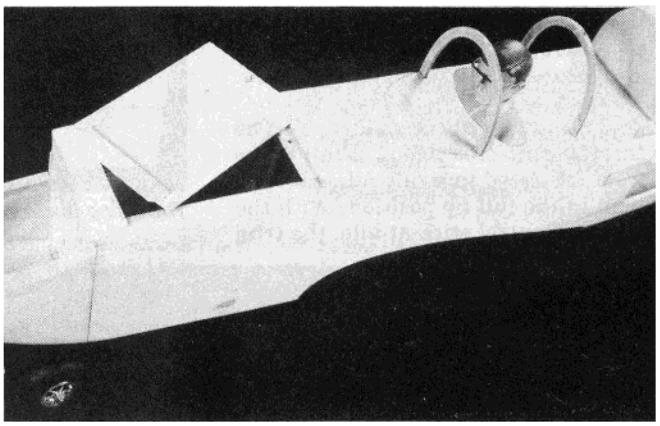


Bottom sheeting and turtle deck stringers have been installed at this point.

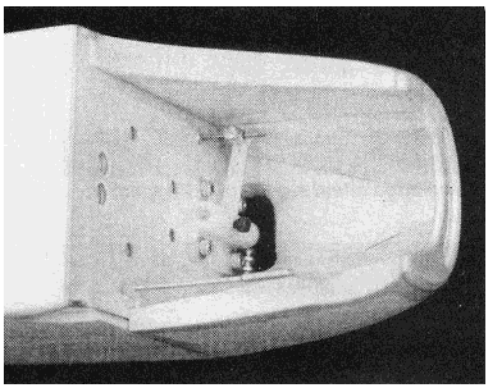
from the covering while gently pressing on the trim with a soft cloth or folded Kleenex. There are no wrinkles and it sticks on like a good thing. Don't ask what happens to the Windex, all we know is that it works well.



The servos and pushrods were easier to install with access from top and bottom available.

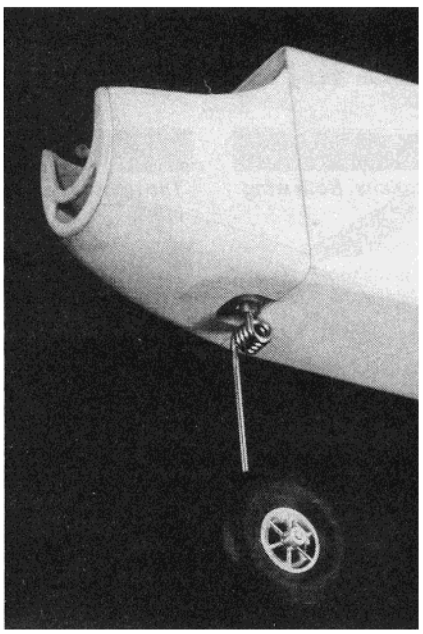


Details of top hatch and cockpit area may be seen in this photo.

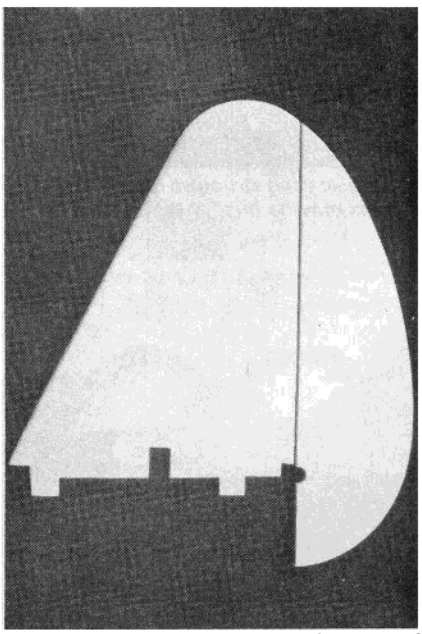


A small notch was needed to clear muffler on the O.S. 25 engine, see lower left corner of photo.

positioned. Place the trim on the wet surface and slide it to the exact location. Now, with your left thumb pressed against the mid-point of the trim piece, use your right thumb working away from the mid-point to press out the Windex and any air bubbles. Wait about 10 minutes and apply a heat gun held about 10" to 12"



The P-51 type opening in nose provides access to nose gear and lower engine mount screws.



Note the alignment tabs on bottom of vertical stabilizer. Stab and rudder are 3/16" sheet balsa.

FUNSTER 20

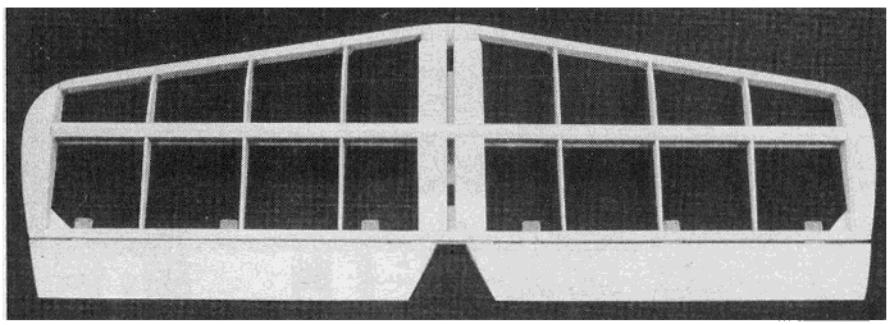
Designed By:
Dick Tichenor
TYPE AIRCRAFT
Sport
WINGSPAN
60½ Inches
WING CHORD
9¾ Inches
TOTAL WING AREA
600 Sq. In.
WING LOCATION
Low Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord

DIHEDRAL EACH TIP
3½ Inches
O.A. FUSELAGE LENGTH
42¼ Inches
RADIO COMPARTMENT SIZE
(L) 9½" x (W) 2¾" x (H) 3⅜"
STABILIZER SPAN
21 Inches
STABILIZER CHORD
6½ Inches (Avg.)
STABILIZER AREA
136 Sq. In.
STAB AIRFOIL SECTION
Flat Bottom
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
7½ Inches

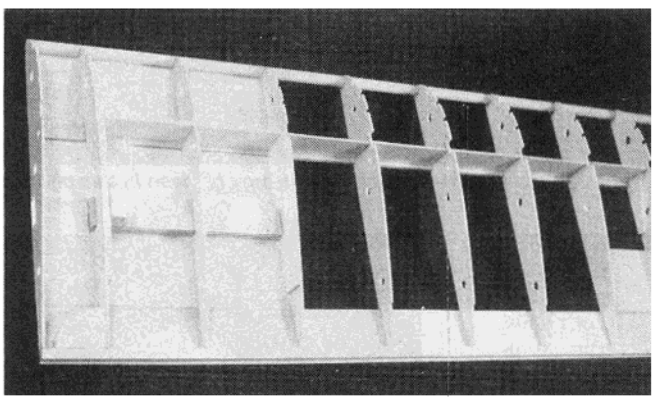
VERTICAL FIN WIDTH (incl. rud.)
6¼ Inches (Avg.)
REC. ENGINE SIZE
.20-.28
FUEL TANK SIZE
6 Oz.
LANDING GEAR
Tricycle
REC. NO. OF CHANNELS
5
CONTROL FUNCTIONS
Rud., Elev., Ail., Flap, Throt.
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa & Ply
Empennage	Balsa
Wt. Ready To Fly	68 Oz.
Wing Loading	17 Oz./Sq. Ft.

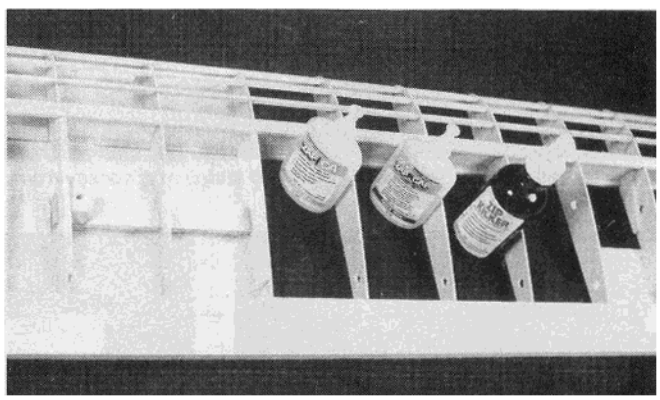
Finally, for the flying --- and that's what it's all about. We will be honest --- everything was rigged to a bunch of best guesses and we lucked out. The only thing that changed from the first set-up was the rudder throw which was increased to 1" in each direction. Elevator travel is 1/2" each way. Ailerons are set for 1/4" up and 1/4" down, and flap full travel is 1/2". The throttle control is rigged to full range from top speed to a safe idle with the trim in the full up position. With the throttle control stick at idle, the trim



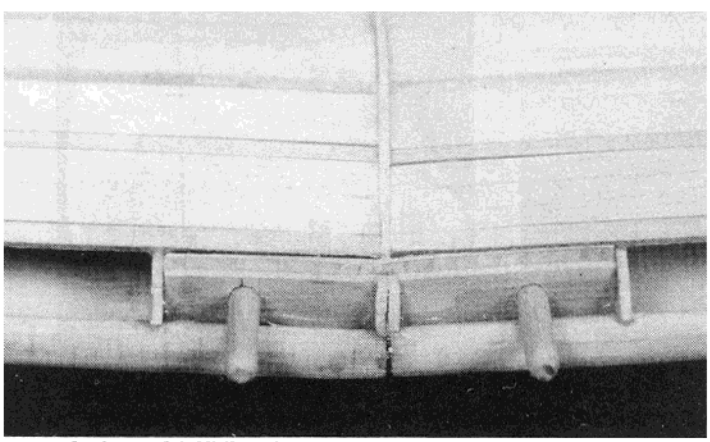
The lifting horizontal stabilizer and elevators are simple, strong, and lightweight.



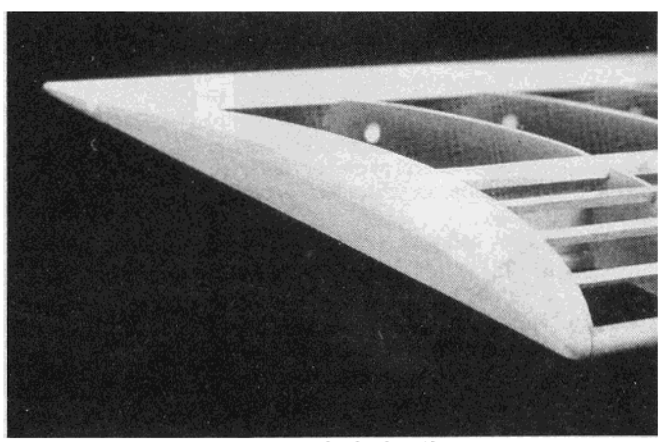
The basic wing structure is built directly on the plans. Both wing panels may be built at the same time.



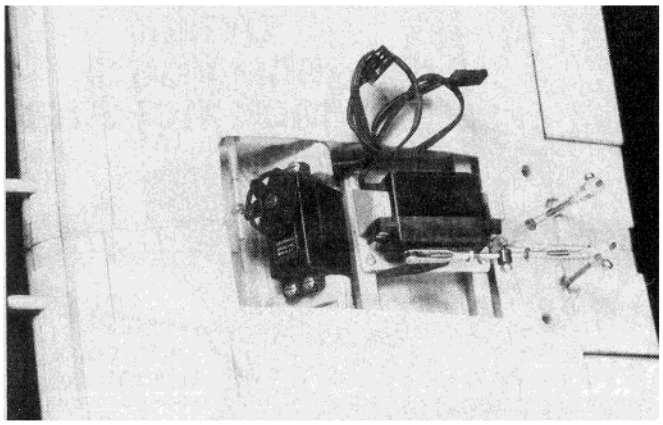
The upper spars and trailing edge sheet are quickly Zapped into place.



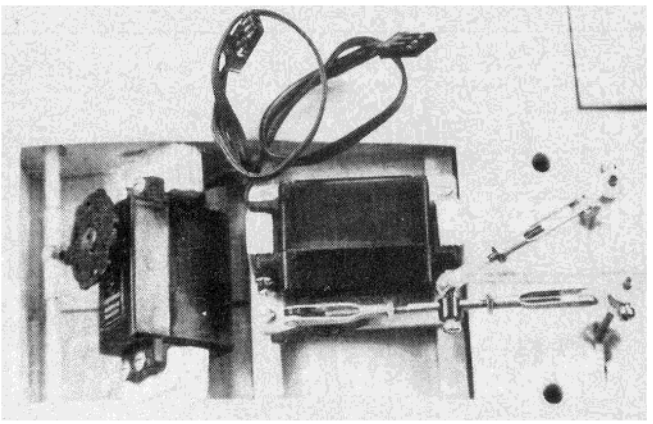
A piece of 1/8" lite ply secures the wing mounting dowels.



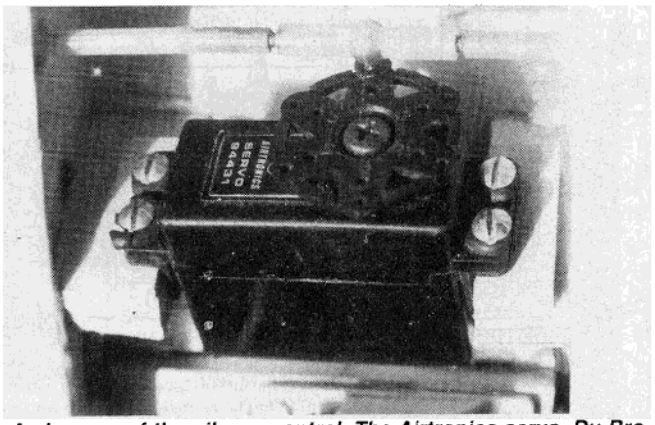
Soft balsa block makes a practical wing tip.



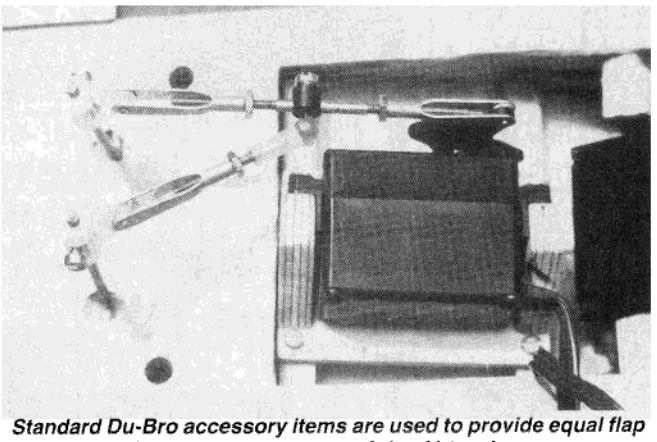
A wrap-around of Goldberg 3/4" reinforcing tape is saturated with Zap/CA for strength at the dihedral joint.



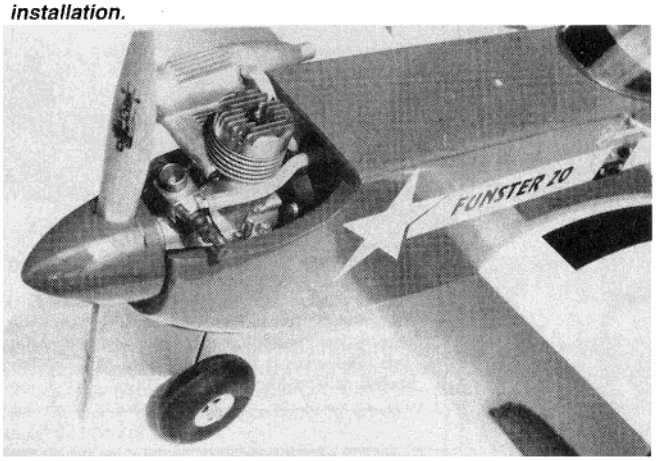
The aileron and flap control arrangements in the wing center section.



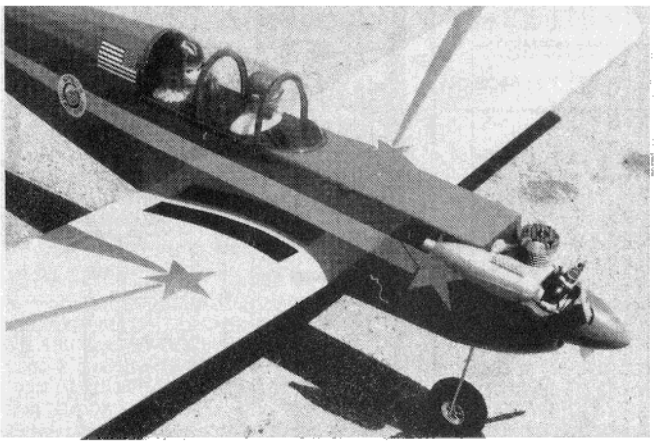
A close-up of the aileron control. The Airtronics servo, Du-Bro aileron connector, and flexible Gold'N-Rod make a compact installation.



Standard Du-Bro accessory items are used to provide equal flap travel from the rotary output arm of the Airtronics servo.



A two line fuel line system uses muffler pressure from the O.S. 25 engine.

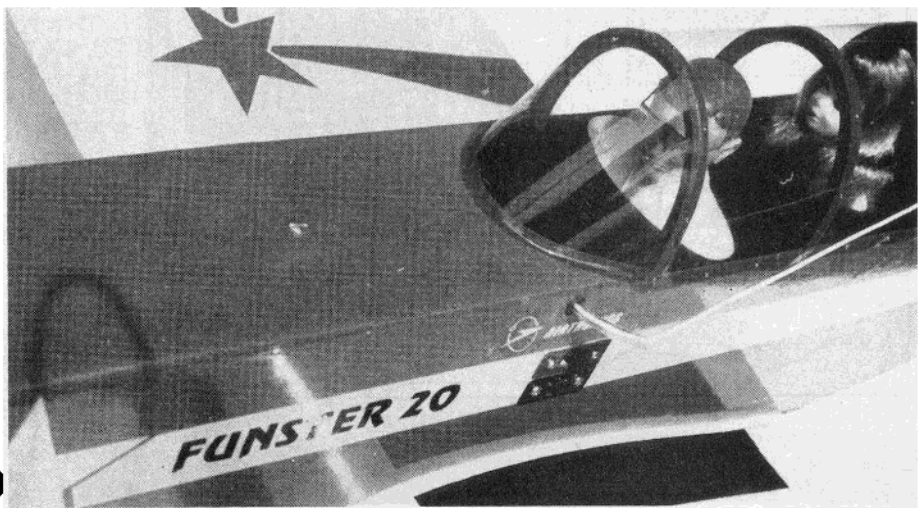


Simple decorations give the Funster 20 a bit of character.

lever is pulled to the bottom to kill the engine.

The C.G. location shown on the plans has been the most satisfactory position for us. It is slightly farther aft than usual because of the lifting stab. Try to keep the ground attitude the same as shown on the plans. With this set-up it sticks to the ground on landing and only takes a slight touch of up elevator to rotate for take-off.

At this point we will close with one word: Enjoy. □



A piece of fuel line tubing is used as an antenna exit.