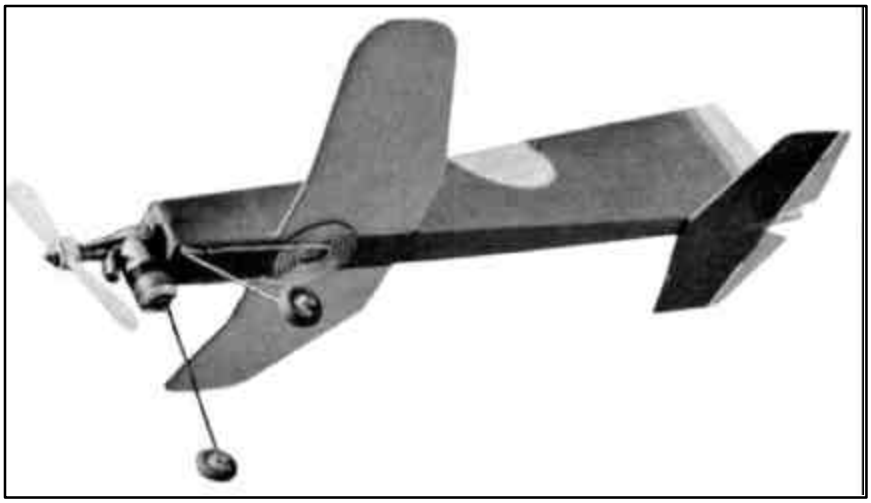
Snapper

By Roy L. Clough Jr



Ever since the first half-A engines appeared we've thought it would be a riot to stick one on a ten-inch wing and turn the contraption loose. We finally pared some wings down to mere stubs on an old free flighter and tried it.

It was a riot . . . a short-lived one.

After we swept up the balsa wood (never leave the pieces in a hayfield—it's bad for cows) and cleaned the turf out of the engine we came to the conclusion that a free flight speed job would have to be a carefully tailored affair. The wild corkscrew gilhooley and painful thump of the clipped down free flighter had given us a lot to think about.

A model intended to reach high speeds in free flight must have (1) a high degree of directional stability, (2) a sharply limited motor run, (3) no tendency to climb or dive under slight variations in power output, and (4) be light and very rugged.

In order to obtain these characteristics we must (A) find some way of managing a whale of a lot of torque with a small wingspan, (B) limiting the motor, run reliably without a timer mechanism, (C) making the model insensitive to gusty weather, and (D) using the lightest and most simple geometry consistent with adequate strength.

"Snapper" is the answer. It is a reliable little ship. It will fly in calm or windy weather with anything from a Cox .010 to an Atwood .049. With a good hot .049 it will hit close to 100mph.

Snapper is rakish, but, except for the cockpit, styling had nothing to do with its appearance. It's designed that way because that is the shape that will best do the job.

Any built-in offsets in thrust line, wings or control surfaces are out. It doesn't take an engineering degree to figure out the reason. The model is light and it goes like a devil with his tail on fire. You'd never get a chance to balance off wing incidence by varying down thrust or to use any of the usual free flight adjustment tricks. The wings, stabilizers, fin and thrust line must be substantially parallel to each other. Dihedral angle raises the tips of the wings and this raises the center of resistance. We have to counter it by raising the thrust line a little above the wing. We require a special fuel tank and it has

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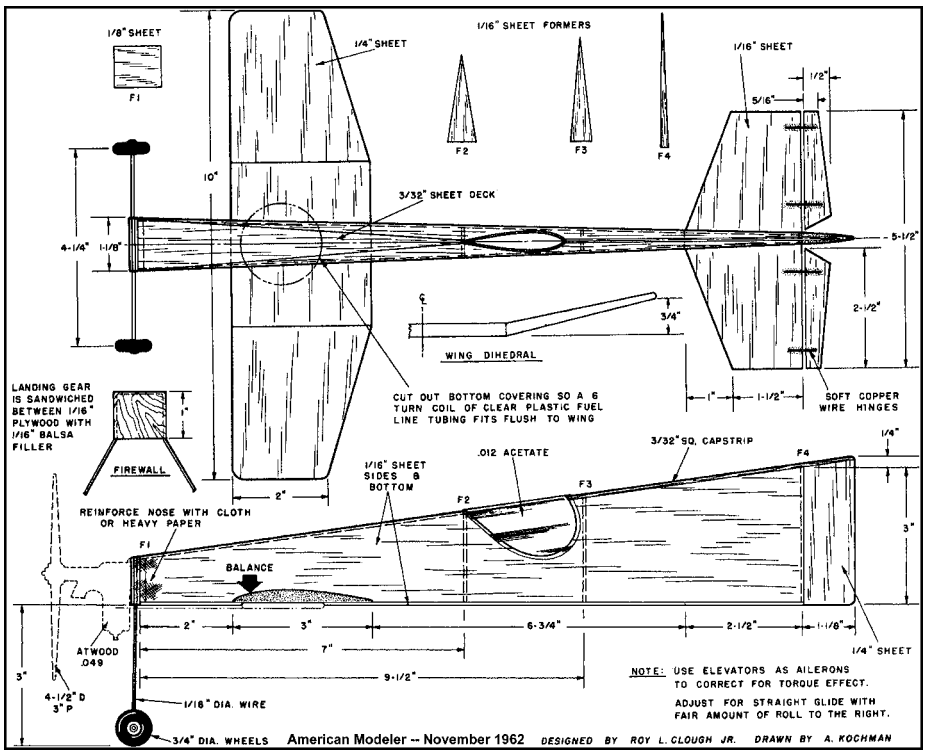
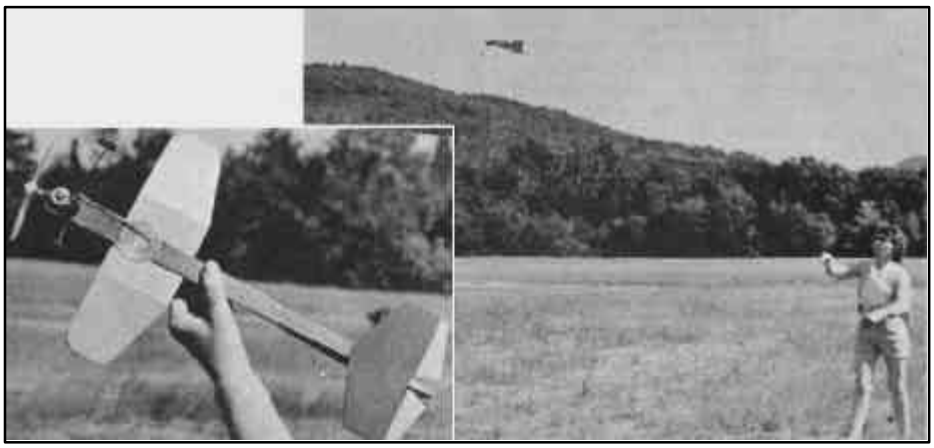


Author Roy L. Clough Jr. wants you to admire that ultra simple, surge-free, positive-duration fuel tank! Full size working Drawings are on Hobby Helpers' group plan #1162



to be on the bottom of the plane. This pretty clearly calls for an inverted engine mounting. So, we start the motor with the plane held upside down where we can check the fuel flow.

Don't try to use a timer tank or fuel shut-off. This little job will chew off about 100 feet of airspace a second when it gets rolling. That means it could be well over a mile away in less than a minute if you forgot, or if something stuck.

Somebody is sure to ask why we included a landing gear on a hand-launched speed job that lands in the grass.

The answer is: it helps to keep dirt out of the engine. But don't expect any wheels-on landings.

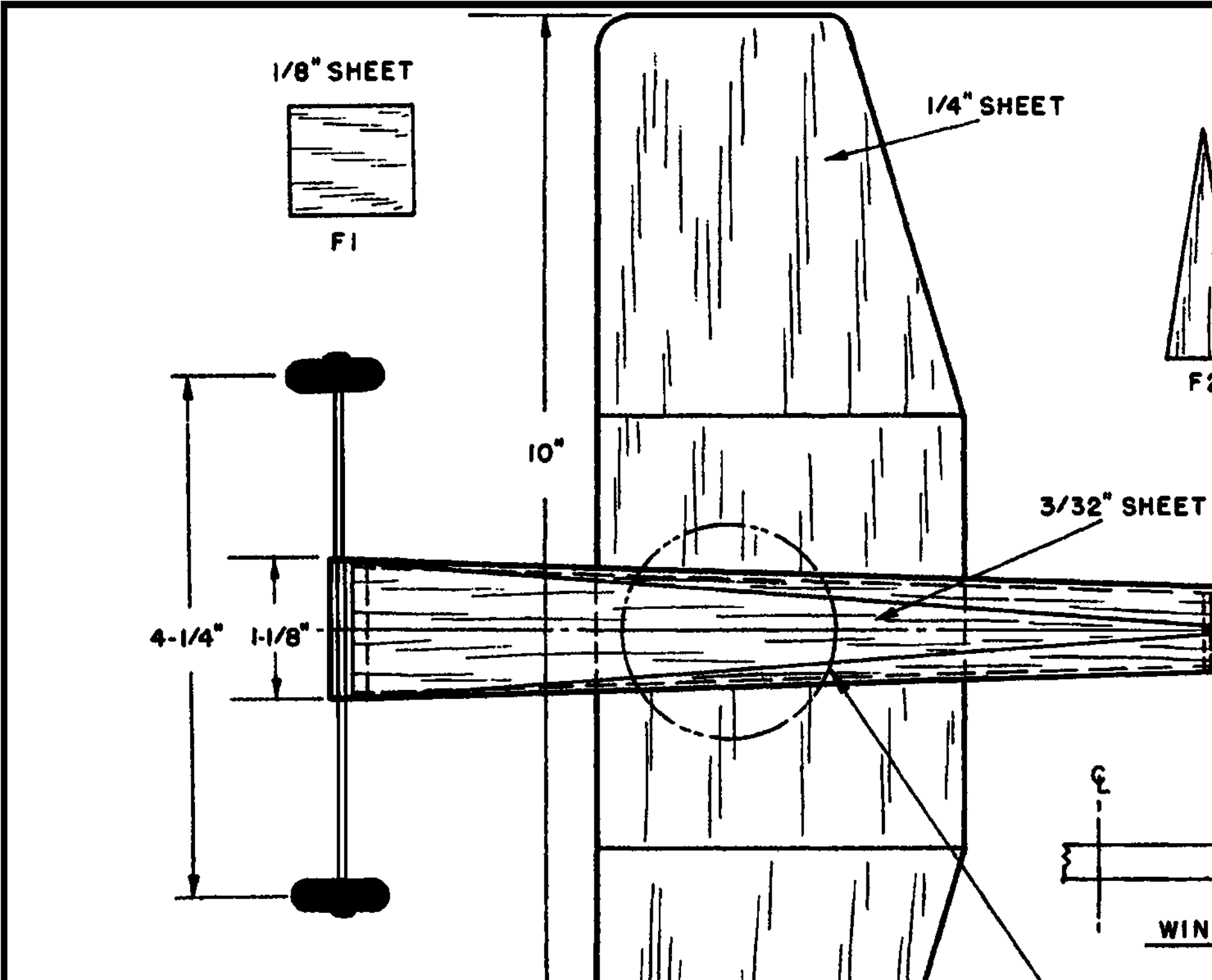
All that torque and no rudder? Just elevators? That's correct. Because of the small span of the model the elevators act as ailerons. This means we correct for torque effect by giving the elevators a differential twist. The left one slightly down, the right one slightly up. The less one has to monkey with on a high-speed rig like Snapper the better.

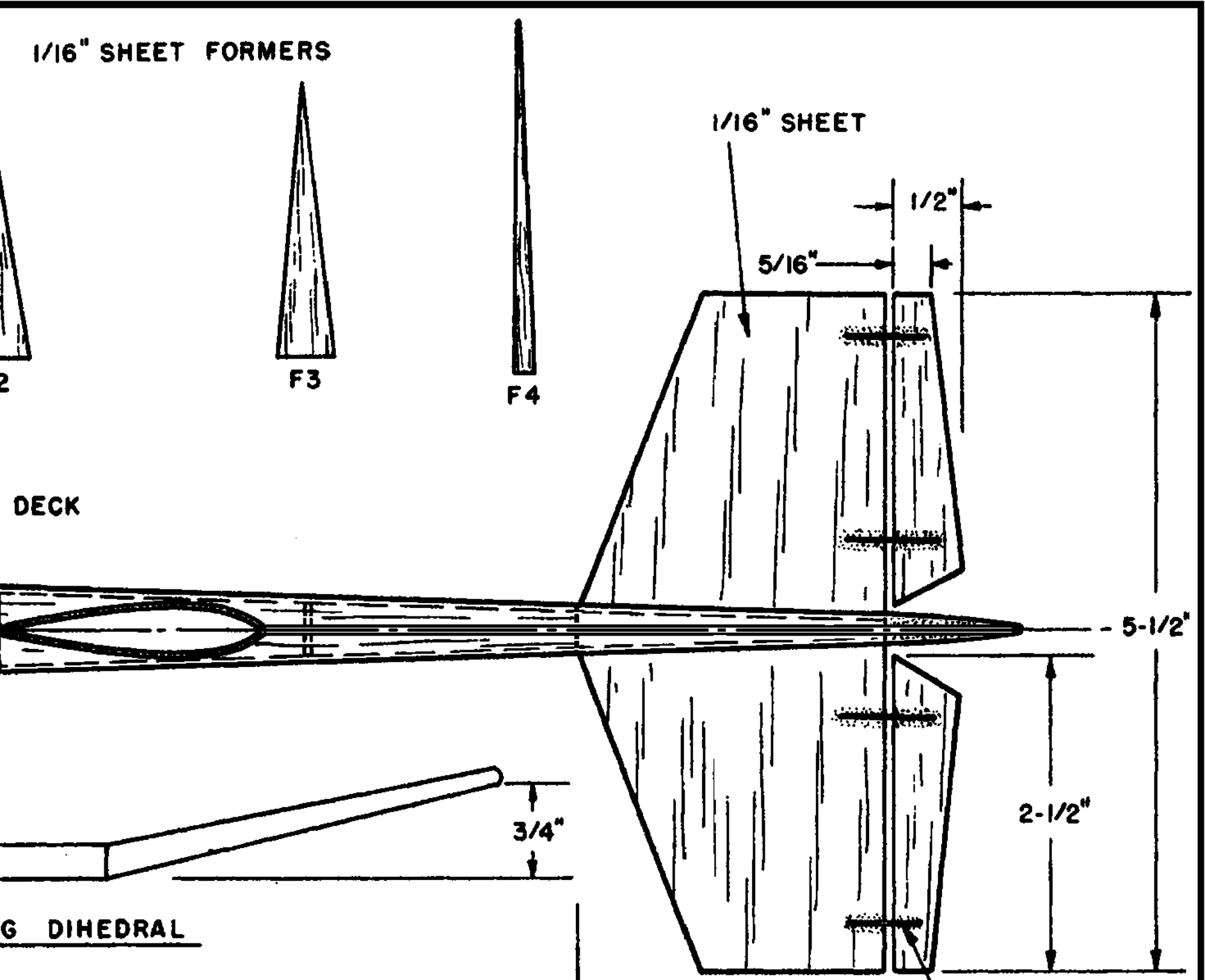
Cut off the needle valve about a sixteenth of an inch outside the needle valve body, file a slot in it and do your adjusting-with a screwdriver. If necessary, jam the needle valve body a little out of round to get the necessary friction. Needle valve settings (on the Atwood) vary about half a turn around the "ideal" position. Model is started with a heavy prime and the first tankful is run out to warm it up. It doesn't seem to be practical to connect the open end of the coiled fuel line to a tank then detach it before flight. This changes the suction pattern and the needle valve, would be in need of adjustment before launching.

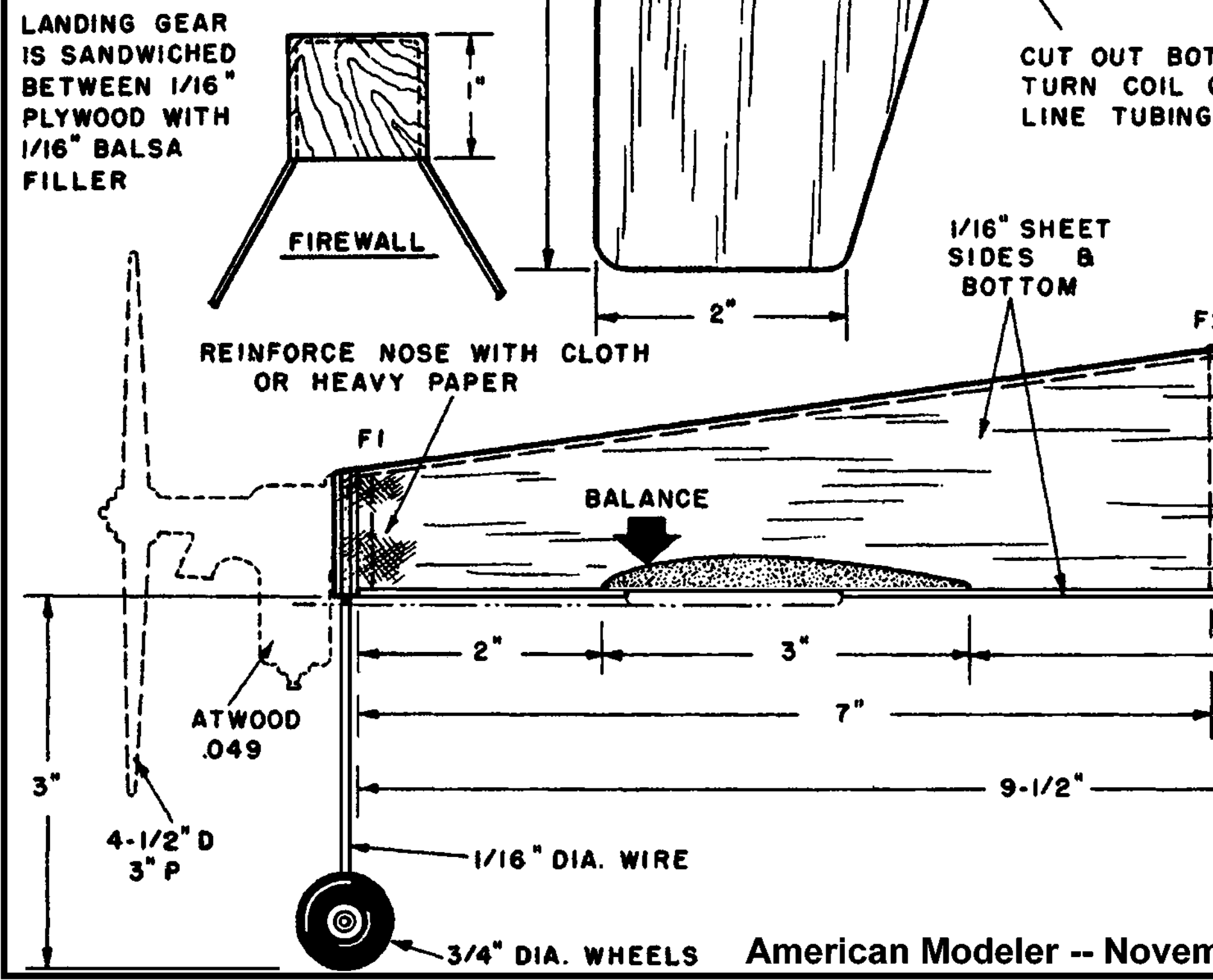
With the arrangement shown the motor turns over for about 12 seconds. That gives you about 8 seconds to detach battery wires, straighten up your aching back and give the model a solid heave. Plenty of time, once you get used to it. The model will whizz for a couple hundred feet before running out of juice. When it does it will slow up like it hit a brick wall and roll to the right. Don't expect much of a glide.

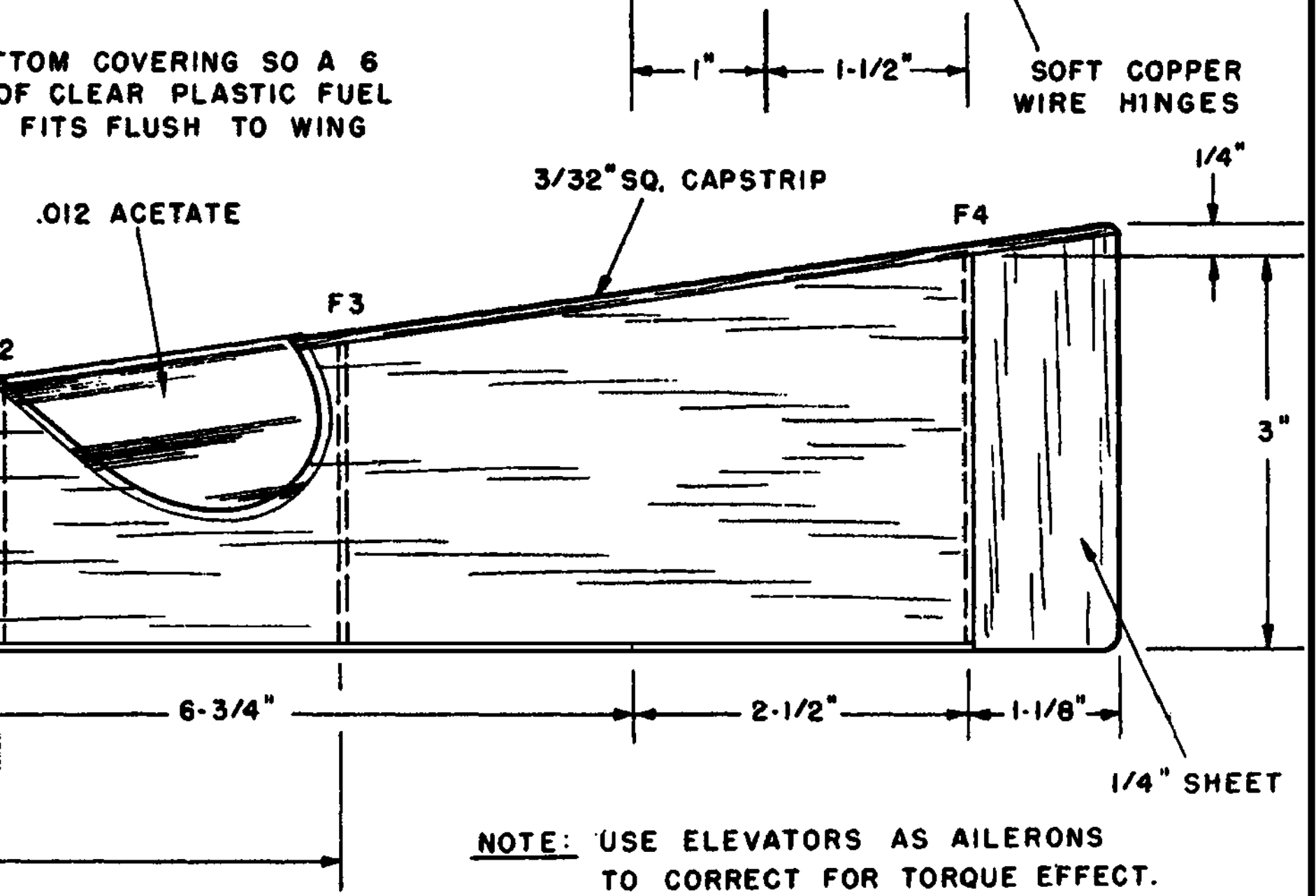
Pre-flight adjustments call for an arrow-straight "glide" with a fair amount of roll to the right. Make your first test hops over deep grass with low pitch props; step up the pitch, and the speed as you – become accustomed to the adjustments. Snapper should fly 10 to 15 feet up,

No thermal worries here!


1/8" SHEET
F1
1/4" SHEET
10"
3/32" SHEET
4-1/4"
1-1/8"
WIN


1/16" SHEET FORMERS
F3
F4
1/16" SHEET
1/2"
5/16"
DECK
5-1/2"
3/4"
2-1/2"
G DIHEDRAL


LANDING GEAR IS SANDWICHED BETWEEN 1/16" PLYWOOD WITH 1/16" BALSA FILLER
1"
FIREWALL
CUT OUT BOT
TURN COIL
LINE TUBING
1/16" SHEET SIDES & BOTTOM
2"
REINFORCE NOSE WITH CLOTH OR HEAVY PAPER
F1
BALANCE
2"
3"
7"
9-1/2"
ATWOOD .049
3"
4-1/2" D 3" P
1/16" DIA. WIRE
3/4" DIA. WHEELS



NOTE: USE ELEVATORS AS AILERONS TO CORRECT FOR TORQUE EFFECT.

ADJUST FOR STRAIGHT GLIDE WITH FAIR AMOUNT OF ROLL TO THE RIGHT.

nber 1962 *DESIGNED BY ROY L. CLOUGH JR. DRAWN BY A. KOCHMAN*