



I Fly a Control-Line Trainer

It looks like a refugee from a Venetian-blind factory, but it flies fine—and it won't stall.

By James Webb

The prop is spun . . . the engine roars . . . must remember . . . pull back on stick. Then ease off . . . in the air now . . . everything's going by so fast . . . trees . . . ski . . . water . . . trees . . . a blur . . . beginning to feel dizzy . . . nose down again . . . must pull stick back . . . there's the sun . . . dazzling . . . can't see very well. . . she's stalling . . . Crash!

I'd cracked up on my first solo flight.

OF COURSE I could walk away from it—you always can; that's a big advantage in flying control-line models over the real thing. But the crash discouraged me from getting a model for the kids. Now, here was Roy Clough Jr., whose model I'd cracked up, with another plane, a funny-looking one. The wing was a series of slats with air spaces between. And there was a big cardboard disk in front of the prop.

"What have you got there?" I asked.

Roy had been mighty nice about his plane—explained that lots of beginners cracked up control-line jobs because they are so fast and so easy to stall if you freeze on the controls. Then he grinned.

"This," he explained, "is a control-line model designed especially for beginners—a basic trainer. She's slow and she won't stall. Swell for kids to learn with. Why,



After a flight checkoutaway she goes

I bet even *you* will be able to fly her."

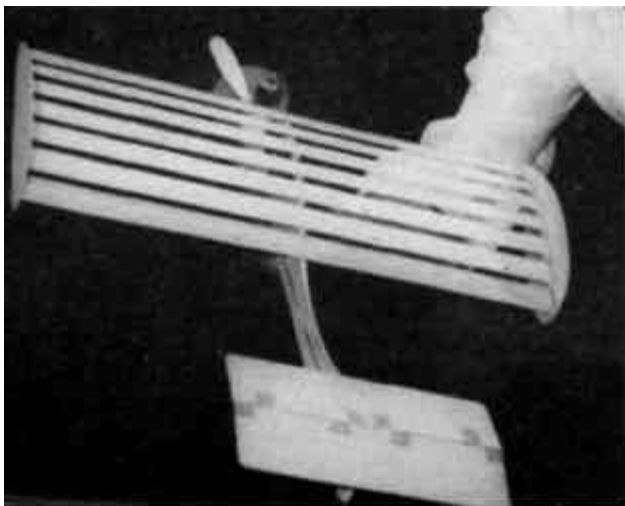
I was in no position to resent that. Instead, I asked for a demonstration.

The little plane took off slow and easy and went around the circle with a lazy lope like a tired hound-dog. Then Roy stuck her nose up and held it there. Instead of stalling and crashing, she kept mushing around, nose in the air, even slower—walking speed.

Roy wasn't kidding. This little job was as different from the model I'd flown before as a cub trainer is from a Shooting Star. "What's the secret?" I asked.

He pointed to the slat wing and the prop disk. "The disk spoils the air stream from the prop so that the plane travels slowly. And she gets the lift to keep going at low speeds from this fancy wing.

WING SLATS set at varying angles, ranging from negative (downward) angle at leading edge of wing to positive (upward) angle at trailing edge, give lift at low speeds. The tail surfaces are hinged with cloth tabs.



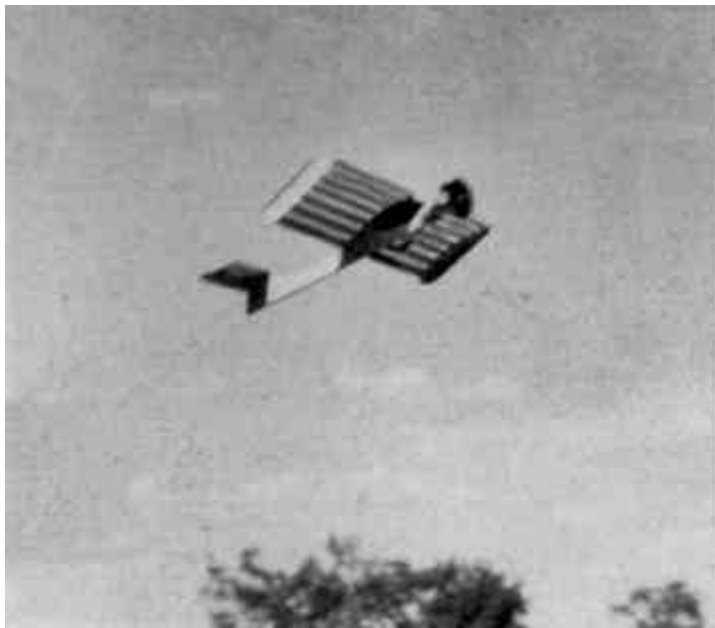
Air compressed under the wing by the forward motion is squirted through the spaces and over the slats to provide the lift.

"And notice the low angle of that front strip," he went on. "That's what keeps her from stalling even when the nose is way up."

I took the controls, and Roy was right. Even I could fly this job, and I could turn her over to small fry with little risk of a discouraging crack-up on the first try. What was equally important, I found I could build a trainer model for the kids myself. So can you. Here's how to go about it.

Fuselage. Trace the fuselage outline on a sheet of 1/4" balsa and cut it out with a razor or a modeler's knife. Cement a 1-3/8"-diameter disk of 1/4" plywood to the nose for the engine mount. Then add two half-round blocks of balsa, faired from the disk to the fuselage, to reinforce the engine mount and hold the mounting nuts and landing gear in place. Cement the cloth-hinged tail surfaces in place and brace them with two wooden toothpicks. Bend a tailskid from soft wire, press it into the fuselage, and secure it with cement.

Wing. Cut the slats for the Venetian-blind wing from 1/8" balsa and cement them to tip racks made from scraps of 1/4" balsa left over from the fuselage. These tip racks must be stepped or



climbing highinto the sky

notched exactly like the fuselage for good alignment. Add 1/16" tip plates to the wing and cement to the fuselage. Coat the model with fuel proof dope to protect it from the engine fuel.

Controls. Cut a T-shaped bell crank from tin can stock and pivot it on a nail pressed into the fuselage. Link the control crank to the elevator horn with a length of 1/32" music wire. Support the wire at its center by a piece of plastic-soda straw cemented to the side of the fuselage. Tie and cement a 25' length of light fishing line to each leg of the bell crank and pass the lines through the wire loop on the wing tip. Trim the free ends to exactly the same length and attach them to the control handle.

Engine. Almost any small half-A engine can be fitted to the mounting disk. Just be sure the engine shaft is mounted at a slight downward angle for good low-speed behavior. Fit it with a 6" propeller and kill its efficiency by fastening a 3" disk of cardboard in front of it.

Operation. As soon as the trainer was finished, the kids and I took her out to the empty lot next door. With Roy along to give us some expert advice, we quickly got the hang of it and could walk her around the circle without any trouble.

Engine tune-up. After you've been flying a while, you may find your engine getting cranky and hard to start. This **probably** means that a gummy deposit



What a show!

from the fuel is clogging the tank and feed line. They can be cleaned with lacquer thinner. But a word of caution. Even a tiny half-A engine has nasty exhaust fumes; spend the evening in your shop turning her over and you'll end up with a bad headache. Have plenty of ventilation, or better still, do your tuning-up outdoors.

Fueling. Your fuel comes ready-mixed—a typical formula has castor oil plus methanol plus nitro-paraffins—in half-pint cans that cost about 55 cents. This may seem pretty high on a gallon basis—\$8.80—but you'll find it's only slightly over a penny a flight. You can fill the tiny tank with an eyedropper, but it's a lot easier and safer to use a miniature pump that any model-supply store carries.

Starting. Prime the engine first until it slops over—don't try to be neat if you

want easy starting. Then hook on the batteries—a couple of 1-1/2 volt jobs wired in parallel. These supply the juice to heat the glow plug that ignites the fuel inside the cylinder. One contact goes to the glow plug, the other to the engine frame. You can make your own connecting wires, but again it's easier to use a ready-made wire with a neat double tip that fits exactly and costs only 35 cents. Of course, you disconnect the batteries as soon as the engine catches.

Before spinning the prop, set the fuel-air-mix screw at the point recommended by the manufacturer—usually three to five turns open. If the engine catches readily but then dies, your mixture is too lean. If it does this even with a rich mixture, your fuel line is probably clogged.

Once the engine catches, the engine will sputter and spit, so lean the mixture until it roars smoothly (it will really roar, too).

Controls. Be careful when you unwind the reel not to cross the control lines. Operation is simple. Hold the reel vertically, with the end upward that is connected to the up action of the elevator. (Mark this end with a red dot on the reel.) Then you pull the top of the reel back to make the plane rise; the bottom to make it dip.

Flying. It takes two people to handle any control-line plane: one to spin the

prop, one at the controls. If there is no bare earth or pavement handy for the take-off run, the prop handler will have to hold the plane in the air and give her a little toss forward; she won't take off from grass. The take-off run should last 10 or 15 feet. Level off after a slow climb. Gentle the controls; the plane responds readily as she picks up speed.

If you freeze onto the controls with the nose up, the trainer will just mush around instead of stalling. But don't get in the habit if you plan to fly conventional models.

You may think the fuel supply is very small; later you can add auxiliary tanks for longer flights. Actually, however, you'll find at first you can get pretty dizzy even with a short flight.

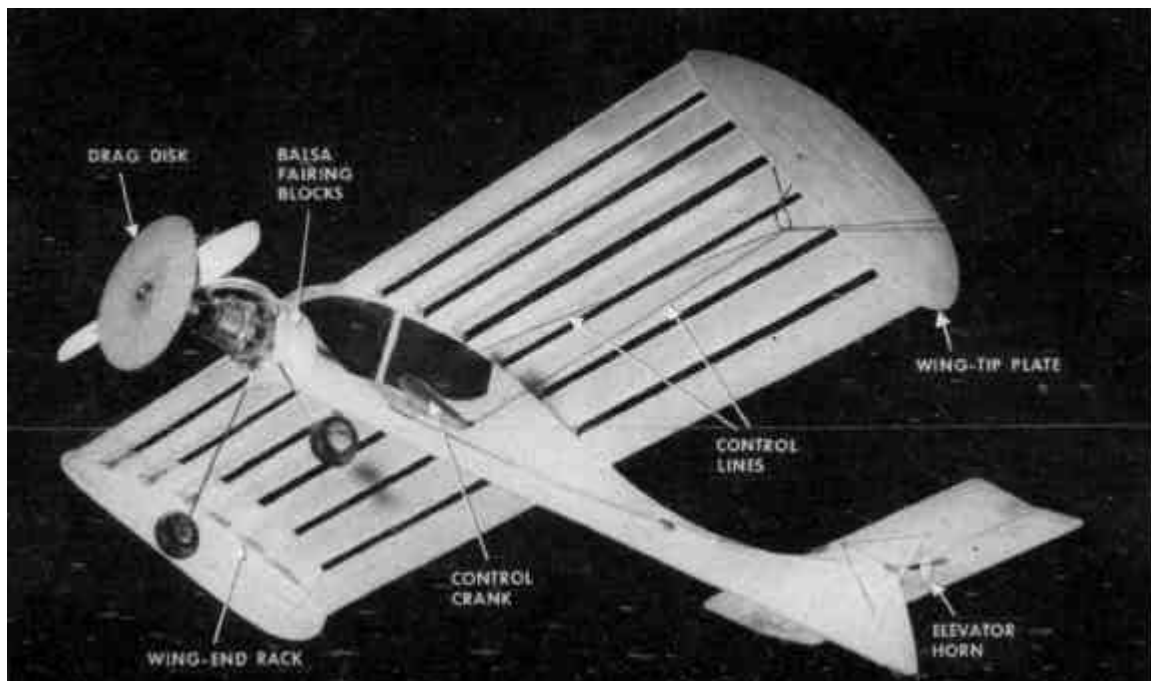
Props. You can vary the speed considerably with different combinations of props and spoiler disks. Those recommended for the plane fly her about as slowly as she'll go and still take off.

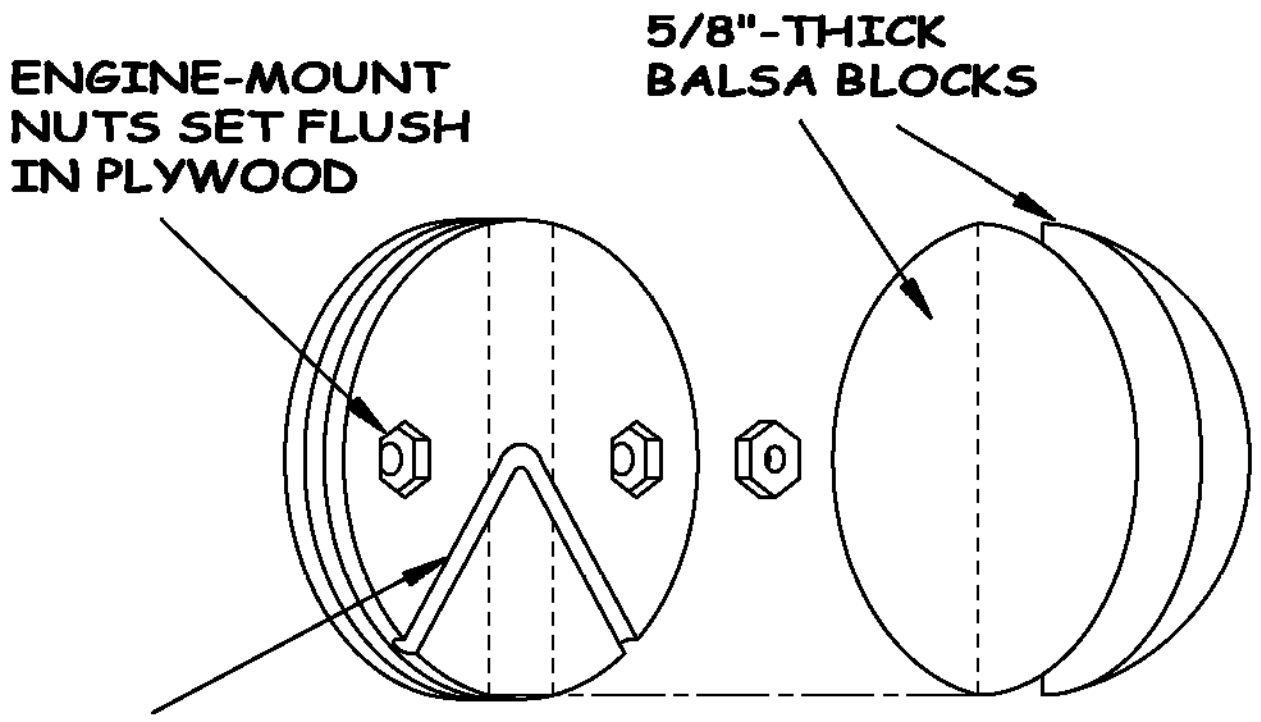
You'll soon find props are expendable, so take along half a dozen spares.

Beware the wind. Because the trainer flies so slowly, she develops very little centrifugal force to keep her out at the end of the control lines. Even a slight breeze may blow her toward you as she flies crosswind—and if the lines slacken, your control is lost. If necessary, keep lines taut by running downwind. - END

A TIN CRANK transmits your pull on control lines to elevator. Lines are attached to a control stick hand-held in vertical position.

The plane climbs when you tilt the stick back, dives when you ease it forward. Cabin windows are painted on the fuselage.





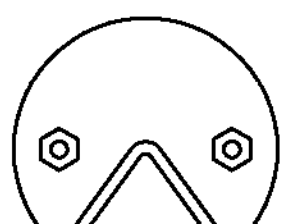
ENGINE-MOUNT
NUTS SET FLUSH
IN PLYWOOD

5/8"-THICK
BALSA BLOCKS

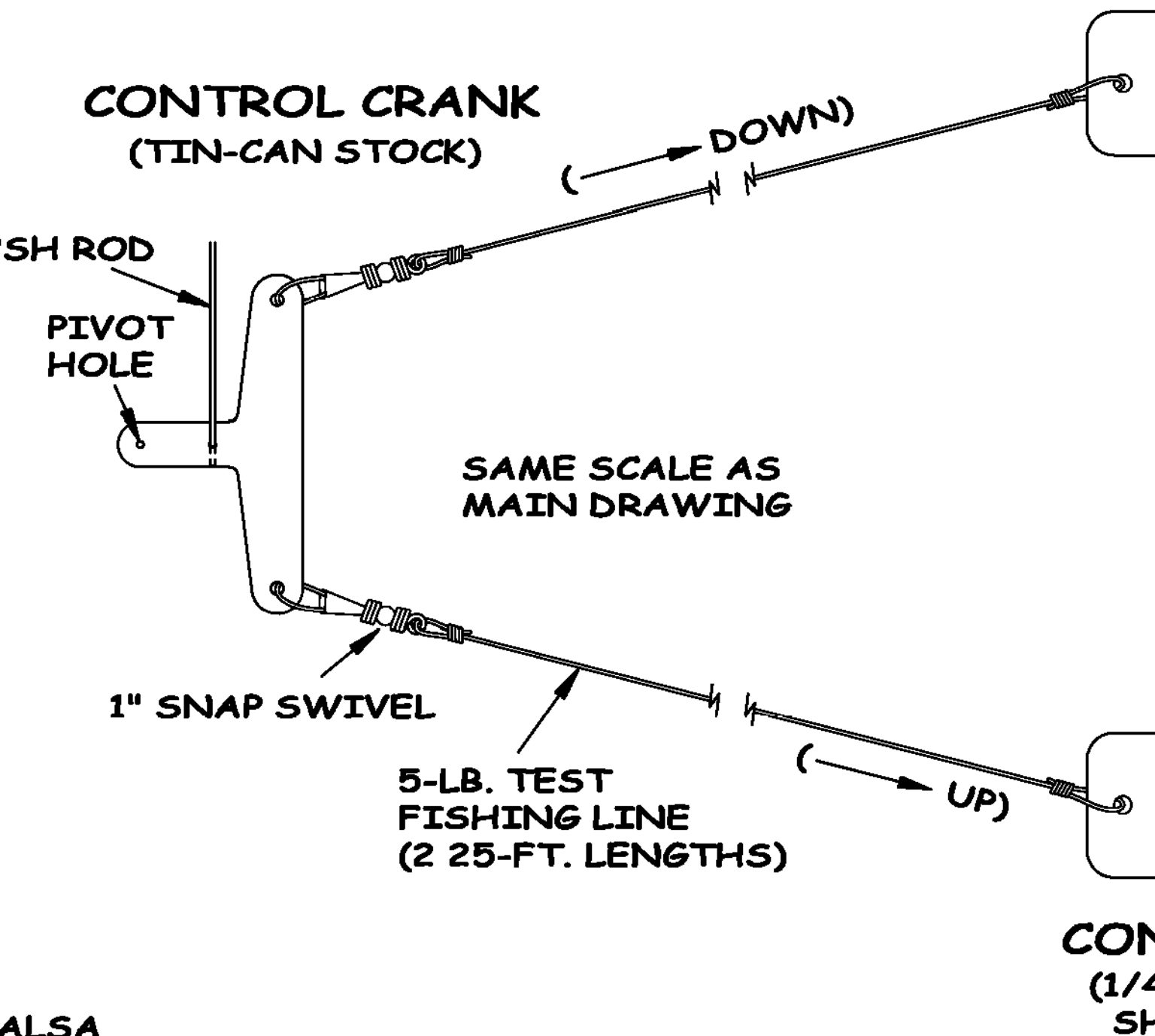
1/16" GROOVE
FOR LANDING GEAR

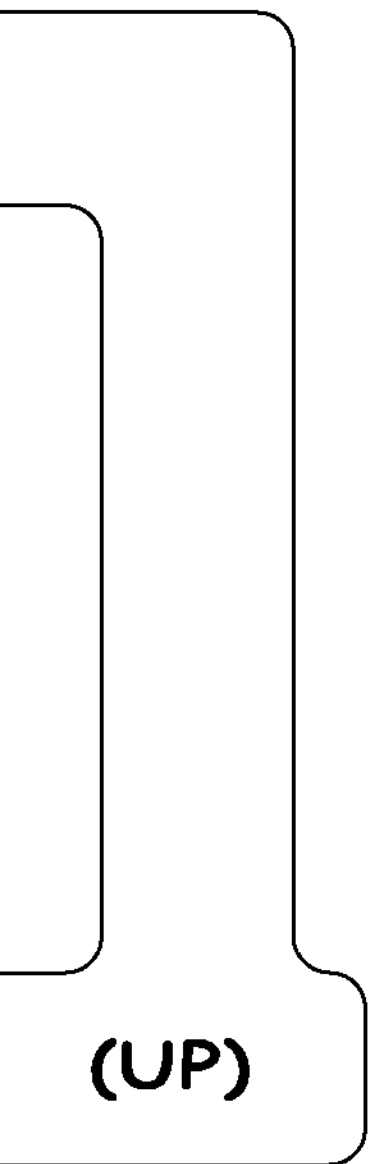
ENGINE MOUNT

5-1/2"
OR 6"



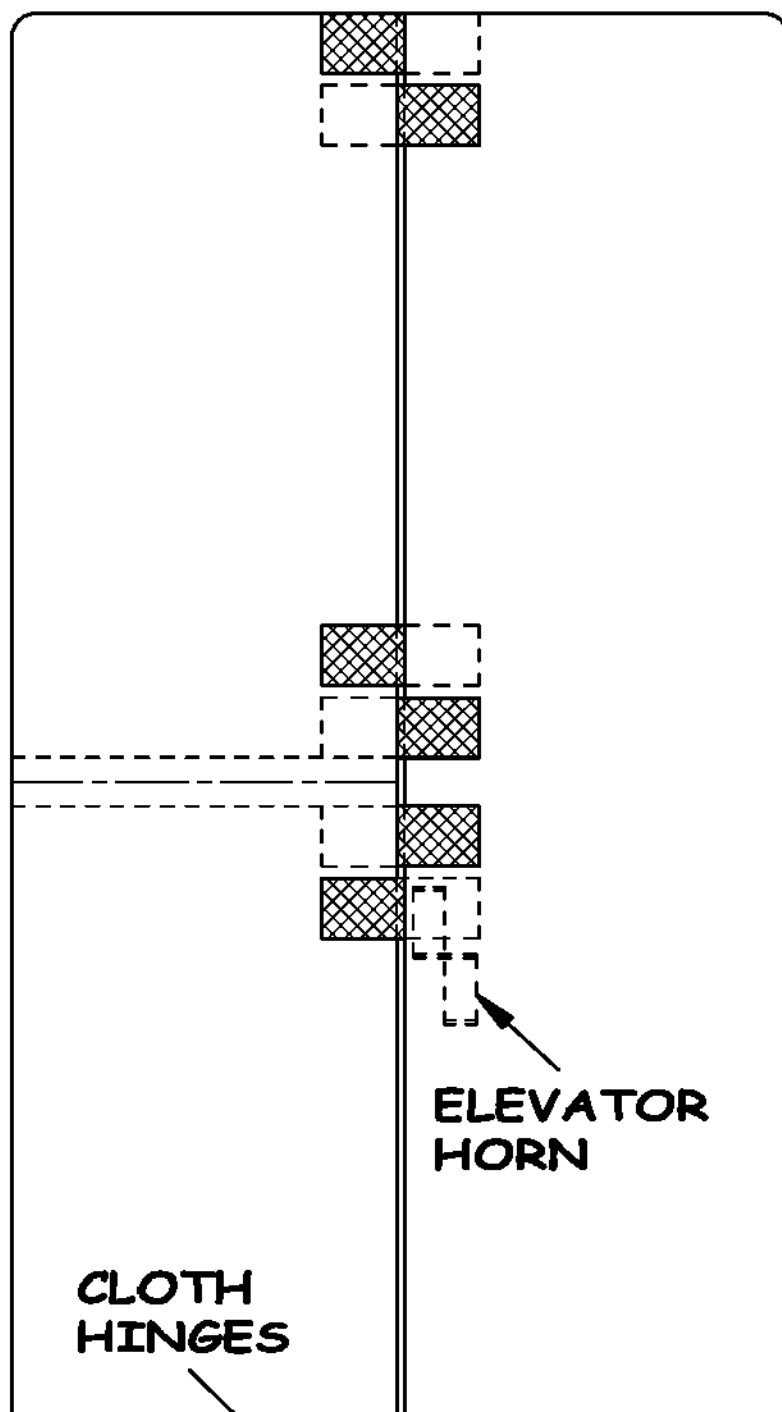
1/8" x 1" SHEET B





(UP)

CONTROL GRIP
1/4" HARDBOARD,
SHOWN UPSIDE



CLOTH
HINGES

ELEVATOR
HORN

PROP

WING SLATS - 18
7 REQ'D.

WIRE LINE GUIDE
ON LEFT WING TIP

1-3/8" DIA. PLY-
WOOD DISK -
1/4" THICK

WASP
.049

1/16" SLOT

THRUST LINE
SHOWN AT 4°
NEGATIVE

SMALL NAIL
FOR PIVOT

CON
CRA

3" DIAMETER
CARDBOARD
DISC

7/8"
WHEELS

0 1 2



AUGUST 1955

3" SPAN

1/16" SHEET TIP PLATES (MAKE 2)

SIDE VIEW

1/32" MUSIC
WIRE PUSH ROD

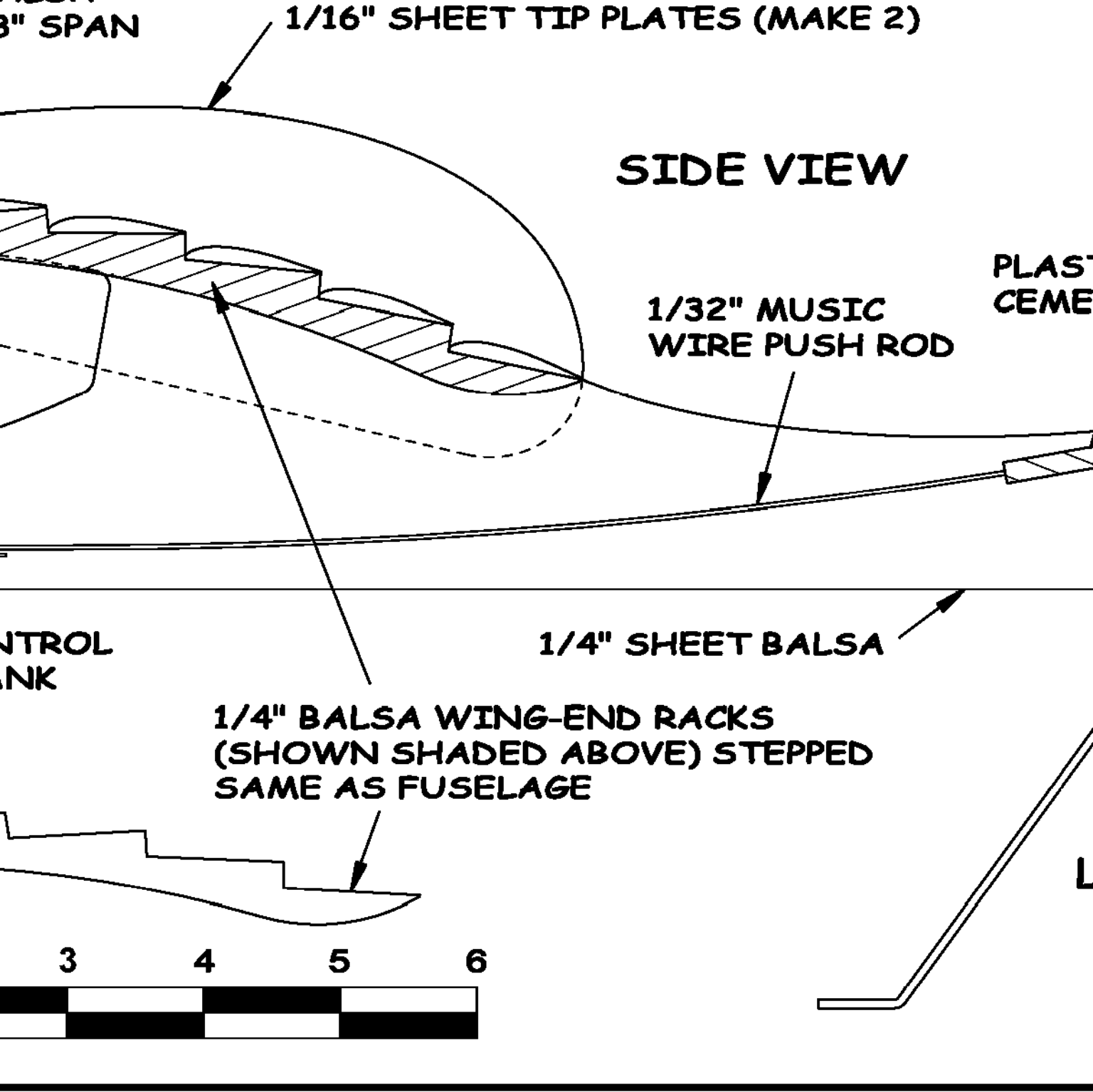
PLAST
CEME

NTROL
NK

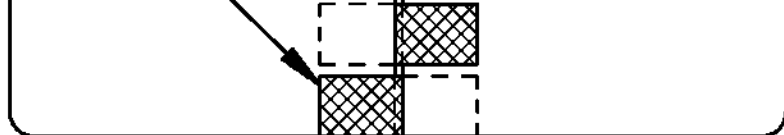
1/4" SHEET BALSA

1/4" BALSA WING-END RACKS
(SHOWN SHADED ABOVE) STEPPED
SAME AS FUSELAGE

3 4 5 6

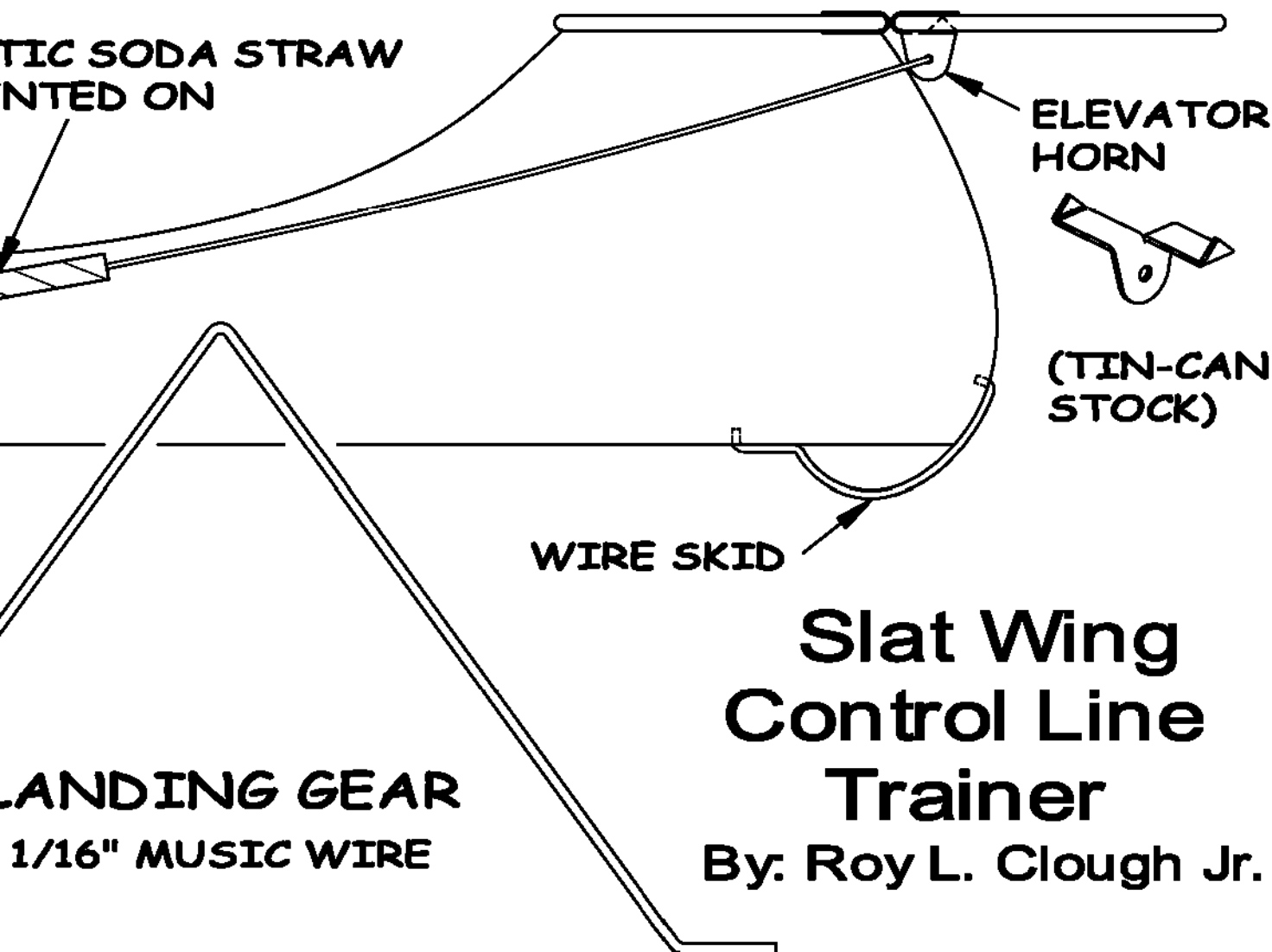


DOWN)



ELEVATOR (3/32" Balsa)

PLASTIC SODA STRAW
GLUED ON



ELEVATOR
HORN



(TIN-CAN
STOCK)

WIRE SKID

LANDING GEAR
1/16" MUSIC WIRE

Slat Wing Control Line Trainer

By: Roy L. Clough Jr.