

by Dale Munyon

• Many are the airplanes that have been converted from conventional air-craft to agricultural spray and dusting craft. Comparatively few are the spray planes that were designed specifically for this job. But, with the increase in agricultural spraying from the few planes and pilots of only a few years ago, to the big business it is today, more and more craft are designed for the main purpose of spraying and dusting work.

Requirements of these craft are exacting; short take-off and landing runs are a "must" due to limited space these craft sometimes operate from. Ease of maintenance is another must. Maneuverability is also very essential as well as good load carrying ability.

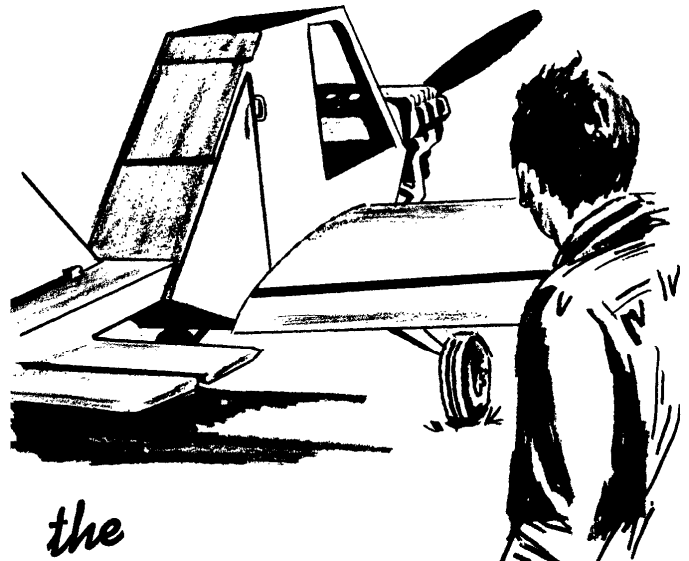
Designing of aircraft to fulfill these requirements has brought about many new concepts of design and Construction. One of the most unusual we've run across is the "Flying Girder" presented here.

As its name implies it is indeed a flying girder, the fuselage being constructed from two aluminum I-beams bolted together with the remainder of the craft built around, and on, this one particular feature.

Due to weight saved by the unusual fuselage construction the full-scale craft can carry large amounts of insecticide or weed spray and gets off the ground fully loaded in only a few feet. Wing tip sealers assist in control of the craft at slow speeds. Dust or spray is stored in a hopper located in the cabin aft the pilots seat. Spray lines are located within the wings with only the nozzles protruding which further reduces drag. The wing itself is of a thick airfoil section giving good weight lifting quality.

Full-size plans of this unusual model are presented here; a quick glance will show that only a minimum of materials is needed, and that construction is not difficult so let's begin.

**FUSELAGE:** What could be easier? The basic fuselage structure is a piece of medium-hard 1/4" x "1 balsa x 13-1/4" long. Locate the bellcrank pivot as shown on the plans and drill a hole for the bellcrank bolt. Cement the two 1" square, 1/16" or 3/32" plywood (also drilled) reinforcements in place and bolt the bellcrank in position.



## the FLYING GIRDER

Cut the two fuselage sides from 3/32" sheet balsa and cement them in place. Install lead-outs from the bellcrank through the fuselage side, and cement 1/8" square cross-braces and fuselage stiffeners in place. Leave the fuselage construction for the time being and go on to the tail surface construction.

**TAIL SURFACES:** These are conventional in construction, being cut from 1/8" sheet balsa. Hinges are cloth; 1/8" dowel is used for elevator joiner. Note that the rear of the fin is slotted, as is the leading edge of the stabilizer. Slide these slotted pieces together, align carefully and cement them securely. Now, cement the rudder to the fin; offset the rudder approximately 1/4" to the right. Cement the entire tail assembly securely to the fuselage and install the He" wire pushrod between the bellcrank and elevator horn.

Return to the fuselage construction by planking the top (cabin) section with 1/16" sheet. Note that the grain runs across the fuselage.

Install the plywood firewall; locate this to suit your engine. The fuel tank is also installed at this time, making sure that you have made provision for filler tube, vents, and overflow. Complete the nose-section planking with 1/8" sheet. The engine can be mounted either upright or inverted. The Sky-Fury we used worked out fine in that the exhaust stacks cleared the fuselage so that no cut outs for exhausts were necessary. However, make sure

that 1/16" to 1/8" clearance is allowed between cylinder head and fuselage planking.

The landing gear wire is bent from 1/16" wire and sandwiched between two pieces of 1/16" plywood and cemented in place as indicated on plans.

**WING CONSTRUCTION:** Wing construction is also conventional with a leading edge of 1/4" square, ribs of 3/32" sheet, and a trailing edge of 1/4" x 5/8". Sand this structure smooth and cover with Silk-Span, then add the line guide to the wingtip rib, and cement tip plates in place. Cement the wing to the fuselage, making sure that all surfaces are aligned. Now, fill in on the bottom of the wing and fuselage juncture with 1/16" sheet so that the wing fairs in smoothly with the bottom of fuselage.

**FINAL NOTES:** Added strength can be obtained on the fuselage and the tail surfaces if these are also covered with Silk-Span. Use light weight Silk-Span, with dope for adhesive.

We gave the entire ship two coats of clear dope, and then doped the wings and horizontal tail surfaces with two coats of red. Sand lightly between each coat. The fuselage and vertical tail were painted light gray. Numerals were cut from decal material. Windshield and windows were of light weight plastic sheet. Control

surface outlines were inked on with ruling pen and then given two coats of clear fuel-proofer. This, of course, won't be necessary if you used fuel-proof dopes. Wheels are held in place with drops of solder, or pieces of neoprene tubing slipped on the end of the axles.

**FLYING:** It is recommended that the first few flights be made on fairly short lines; approximately 25 feet should be okay. After you've become familiar with your model, line length can be increased to about 50 feet.

**BILL OF MATERIALS** (Balsa unless specified otherwise)

1-1/4" x 1" x 36"	Back bane, nose block
1-3/32" x 3" x 36"	Sides, ribs, tip plates
1-1/8" x 3" x 36"	Tail surfaces, planking
1-1/16" x 3" x 36"	Planking
1-1/8" x 1/8" x 36"	Cross-braces, stiffeners
1-1/4" x 1/4" x 36"	Leading edge
1-1/4" x 5/8" x 36"	Trailing edge
3/32" plywood; 1/16" plywood, 2" bellcrank; 1/16" piano wire; 1-1/4" diameter wheels; 1/4" tailwheel; lead-out wire; control horn; 1/8" dowel; cloth hinges; cement; dope; fuel-proofer Silk-Span; .049 to .099 engine; tank; propeller.	