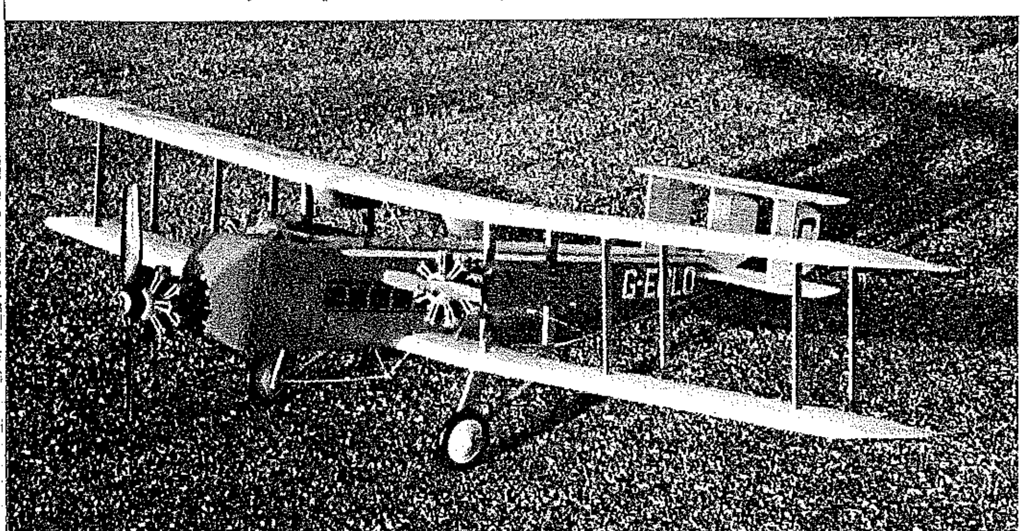
There have always been two things that make a model popular: a unique look and a unique sound. Here's a Control Line sport model that combines both into one package. ■Dave Haught

ARGOSY I

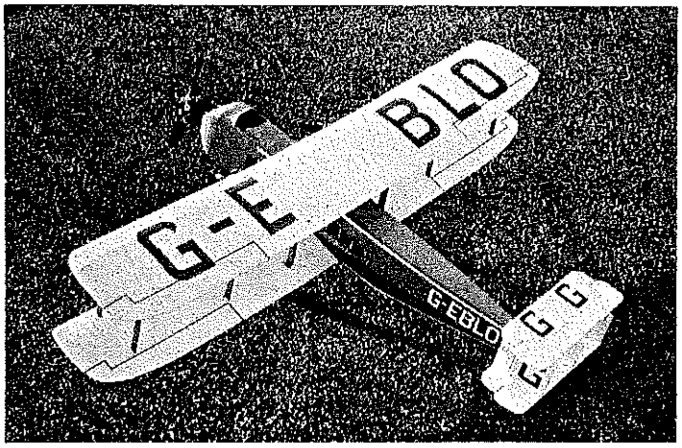
STANDING ON THE RAMP at Chicago's O'Hare Airport, deafened by the roar of the big jets, it's not so easy to picture how it must have been. Turning the calendars back 50 years takes a real effort of imagination. But suddenly, complete with sensory details, the scene springs to mind: the cracks in the paving, the smell of the oil, the abundance of noise and blasts of wind. The steel fences blur into grassy fields, and mountains of parked cars become the nearby hills covered with spring wheat. Though the image wavers before my eyes and threatens to fade, I manage to hold onto it. Wherever there are wings, engines, and dreams, the ghosts of yesterday's wings can't be far away.

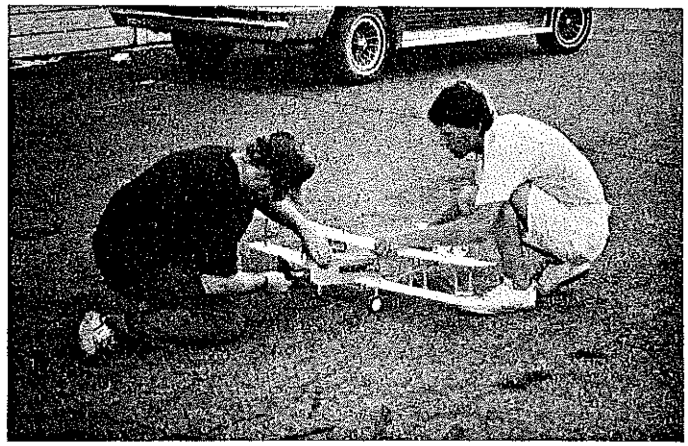
The Argosy, to a young enthusiast, must have been formidable: almost 20 ft. tall, huge white wings, and immense, round, throbbing engines—not just one or two, but three! Mammoth, powerful—even graceful, if you look beyond the uncowled engine mounts, the external control wires. And the sound! If you've never heard the roar of one of these big, round engines, you can't fully conceive of it. For me, the Argosy sings. And the song it sings is not like a top forty tune, an evanescent wisp that's here today and gone tomorrow. It's a vintage song, a rich, classic sound that only time and a few fans will really understand.

The particular Argosy with which I was acquainted was a mainstay of the fledgling British Imperial Airways in 1926. Its job was to pave the airways from London to Paris and eventually into Africa. The three 14-cylinder Siddely Jaguar III engines easily carried the 20 passengers and two pilots on their many journeys. At a top speed of 90 miles an hour, the Argosy was a reliable steed.

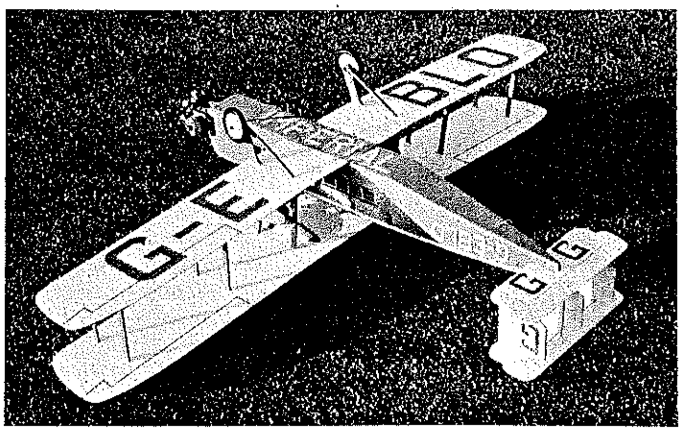


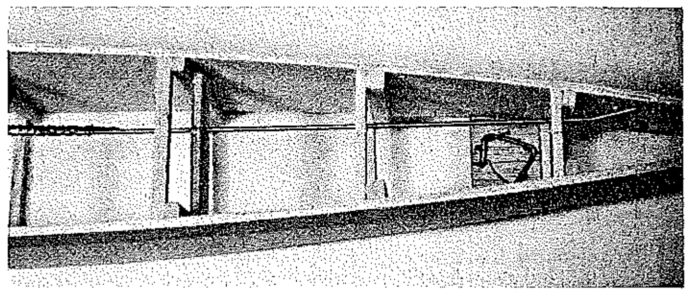
Top: The size of the Argosy is just right: big enough to handle most flyable weather and small enough to slip into the car without knocking out the windows. Above: Some would call her ugly, crude, and awkward, but they probably polish their shoes every day and have never seen under the hood of their cars. The Argosy appeals to the adventurous and the nostalgic.



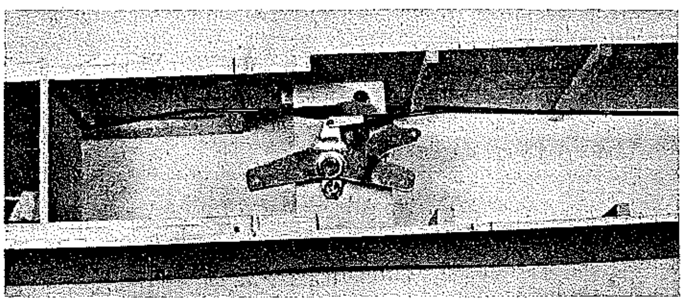


Left: This will be one of the few Scale models you'll ever build that does not need nose weight! With all the wing the Argosy has and with two stabilizers on such a long tail moment arm, she is a smooth-flying model with a good solid groove. Right: Dale Kahler does the honors of holding the model on its maiden flight. The dummy engines have been removed for safety. With three engines running you have to be very careful.

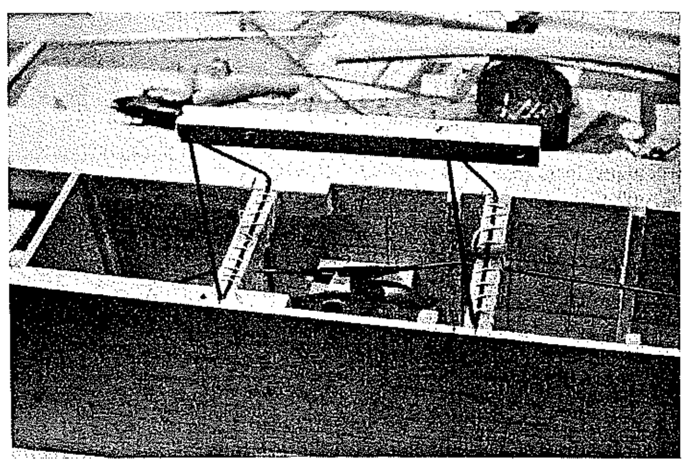




Left: Dave says he hopes you like to letter. The Imperial Airlines used their airplane's advertising space well. In bright blue and white the Argosy is eye catching. Above: Most of the fuselage formers are open-box formers made from strip stock. A plywood strip serves as a pushrod bushing midway between the bellcrank and the elevator. Tail skid mount plate in the fuselage bottom is visible to the right.



Above: The three-line bellcrank is located and hooked up but not glued in until all the fiddling is done. Once the pushrods are run, the throttle and elevator throws are adjusted and the lead-out holes located, it is epoxied into place. Right: While the bellcrank mount is still loose, the cabane struts can be adjusted for the right fit. Note the heavy thread wrapping to secure the wires. The wooden strip at the top of the struts holds the right spacing for the top wing holes.



Though it was soon outstripped by faster denizens of the skies, the Argosy lives on in the guise of my Scale model. She still puts in a lot of flights, even if it's only around a grass field, surrounded by the head-high corn and cheered on by a bunch of young enthusiasts in the wilds of Minnesota.

The first flight of my Argosy was a thrill. Though we used only the main engine, the excitement was the same as I remembered. She rolled out quickly, boldly, not even concerned that her family hadn't taken to the air for over 50 years. She was alive! That's the great thing about Scale models, especially Control Line Scale. You catch the feel of the ship as it gathers its own speed and flies at the command of your hand.

Firing up those second and third engines had the effect of squaring, and then cubing, the thrill. And the sound . . .!

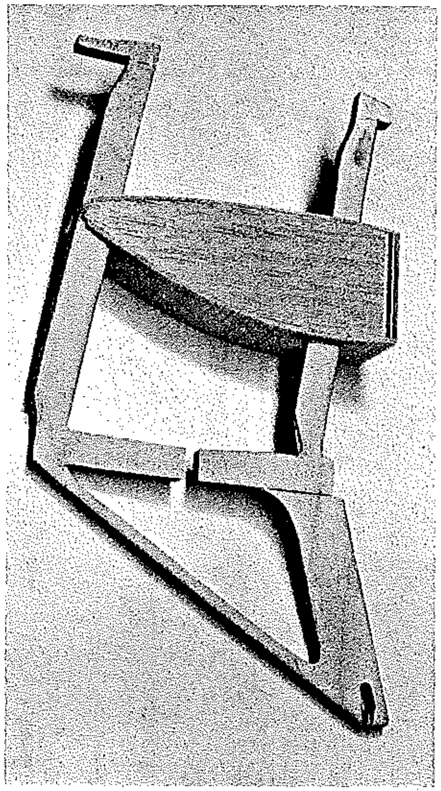
If you've stayed with me this far and are not itching to get to the balsa, you might want to check your pulse. Otherwise, let's build you an Argosy of your own.

Construction. Biplanes are tough to build. When the bug hits you, you're in for it, that's all. The Argosy is tougher still. If building two wings seems like a lot, how about building two wings, two stabilizers, three rudders, two nacelles, and on and on? This one is a *project*.

I say the foregoing not to discourage, but to warn. The Argosy is not a model one puts together over a three-day weekend. It's a lot of work—but very well worth it.

Study the plans until you can draw them in your sleep. Then find a copy of Kenneth Munson's book, *Airliners from 1919 to the Present Day*. It has a good, very detailed two-view drawing of the Argosy that will help answer a lot of questions.

Tail assembly. Beginning with the tail is ideal for this model. The builder is encouraged by seeing some quick success. With the Argosy you don't really encounter the problem of excess tail weight. In fact, I had



The key struts make life easy when it comes to lining up everything. The nacelles are built right onto the struts. Both a right- and left-hand key strut assembly are required. Note the slot for the shock absorbing axle.

to add three ounces to the tail to make it balance—not your usual problem with a Scale model.

Cut out all the parts from a sheet of medium-weight 3/16-in. balsa. You'll need two each of the stabilizer and elevator parts, and three of all the rudder and fin pieces. Sand the edges appropriately. Equip the stabilizers and elevators with your favorite hinges, and mark the fin locations on the top of one and the bottom of the other.

Glue the rudders to the fins with the offset shown. Glue the fins to the bottom stabilizer. After checking that everything is straight and parallel, add the upper stabilizer. Reglue all the joints, and admire your work. Any areas you missed on the first sanding can be touched up now.

Wing. Cut out all the ribs, tips, and dihedral braces; notch the trailing edges. Pin the lower spars to the workbench along with the leading and trailing edges. Position the ribs with the appropriate spacings. Notice that the interplane struts are 1/8 in. thick and the key struts are 1/4 in. thick.

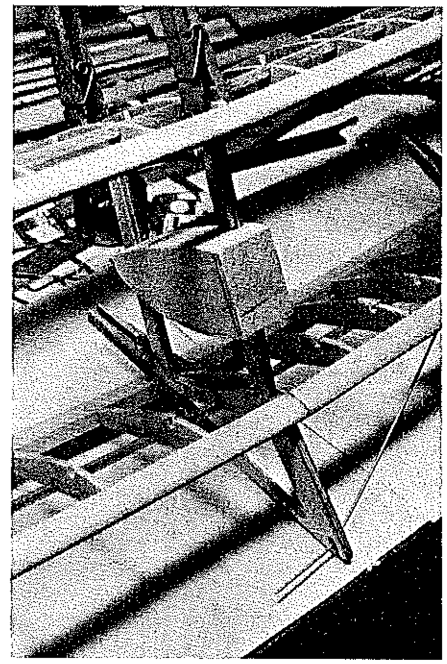
Each wing is built in three panels as shown on the plans. After the ribs are dry, add the top spars and join the tip panels to the center sections, including the dihedral angles.

You'll notice that the lower wing is a bit longer than the upper one. Don't panic; that's the way it's supposed to be. Drill the upper wing center rib R-1 at the indicated angle for the cabane struts. Attach the landing gear plate to the center section of the lower wing.

Reglue all the main joints in the wings, adding any gussets you think might be necessary. Carve the leading edges to shape, and give them a thorough sanding. Add the tip weight, and solder the wire landing gear pylon in place on the lower wing.

Key and interplane struts. The key struts are exactly what their name implies: the key components in the system. Lay them out carefully and accurately, then saw them out of 1/4-in. plywood—the good five-ply type, not Lite Ply. The key struts will carry the full load and vibration of the outboard engines, so they must be very strong.

Note the slot for the wire axle on the landing gear. Make sure the wire can travel the slot easily, but not sloppily. Trim the wing spars as required to fit the key struts to the wings. They should fit just right without binding or warping the wings. Make whatever adjustments are necessary for the proper fit. When you're satisfied, give the struts a sanding, smoothing the leading and trailing edges to a nice radius.

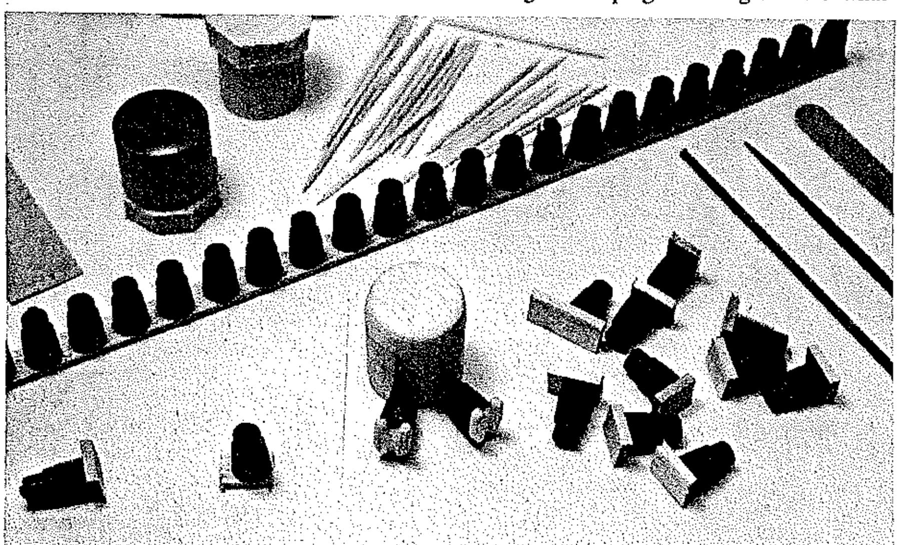


A pre-assembly check helps make sure everything is going to work when the glue is on. Here the outboard key strut is being fitted.

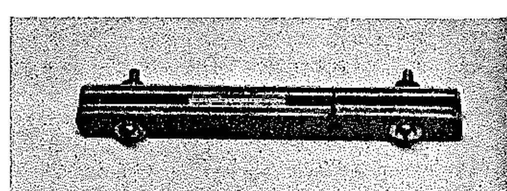
Cut the eight interplane struts from 1/8-in. plywood. Sand, and set them aside. Using the key struts as a basis, begin making the nacelles. You'll need to make both a right- and a left-hand nacelle. Cut the four sides from 3/32-in. sheet, and glue one side to the side of the key strut. Cut out the 1/4-in. plywood engine mounts, drill them, and glue to the front of the key strut. Study the top view of the nacelle, and cut the top and bottom parts to match it from 3/32-in. sheet balsa. Sand to the contour shown, and add the other side sheet. Repeat the procedure for the other nacelle.

Engine. Chances are you're tired of working on the big assemblies by this time and would enjoy some detail work. Order 42 dummy plastic engine cylinders from Peck-Polymers, and settle in for a bit of engine production work.

To make a row of cylinders as shown in the accompanying photo, I stripped a length of 1/8-in. sheet to the width of the top of the plastic cylinders, then glued the cylinders to the strip at 1/8-in. intervals with cyanoacrylate (CyA). Using a razor saw, I cut each

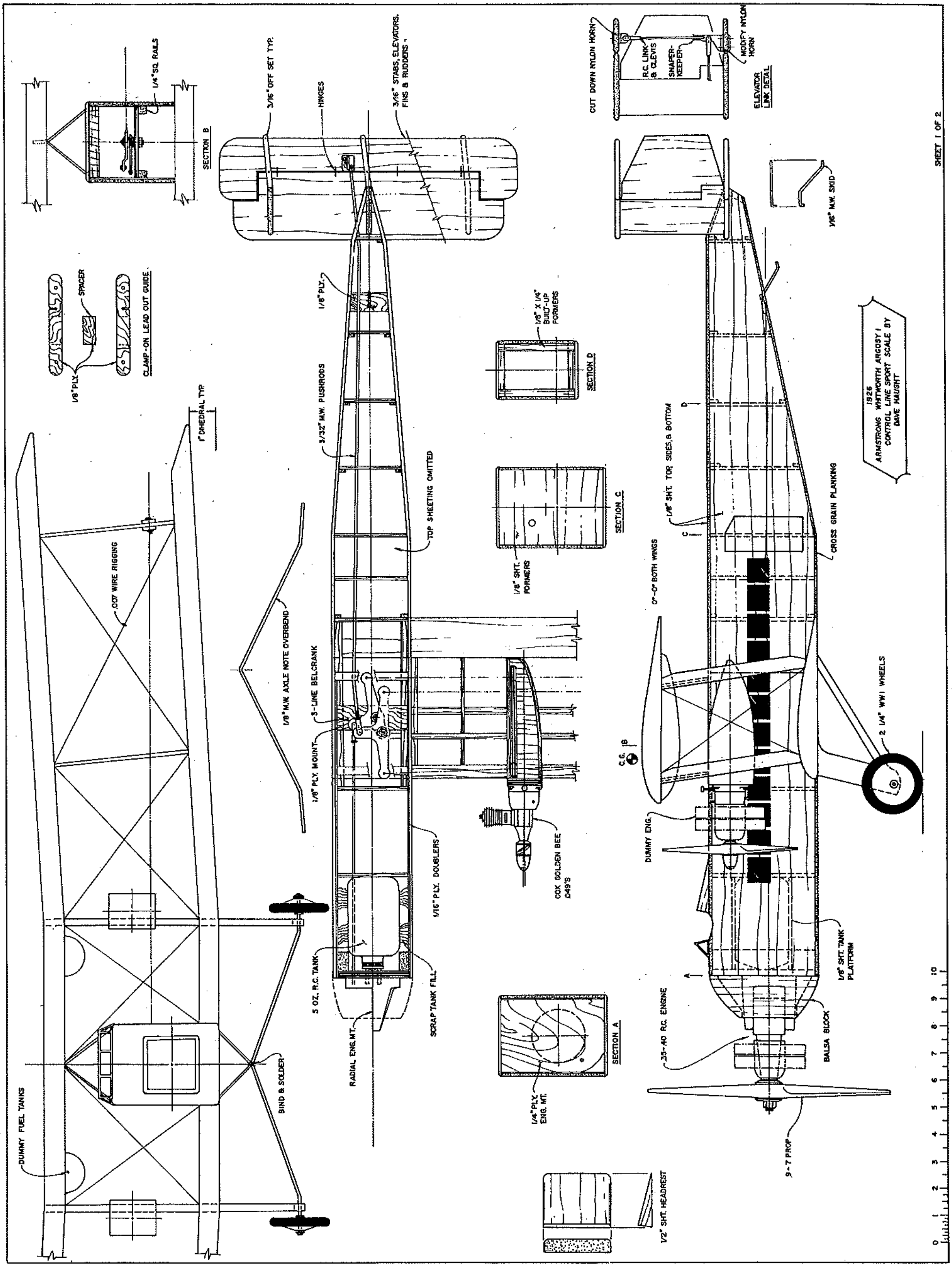


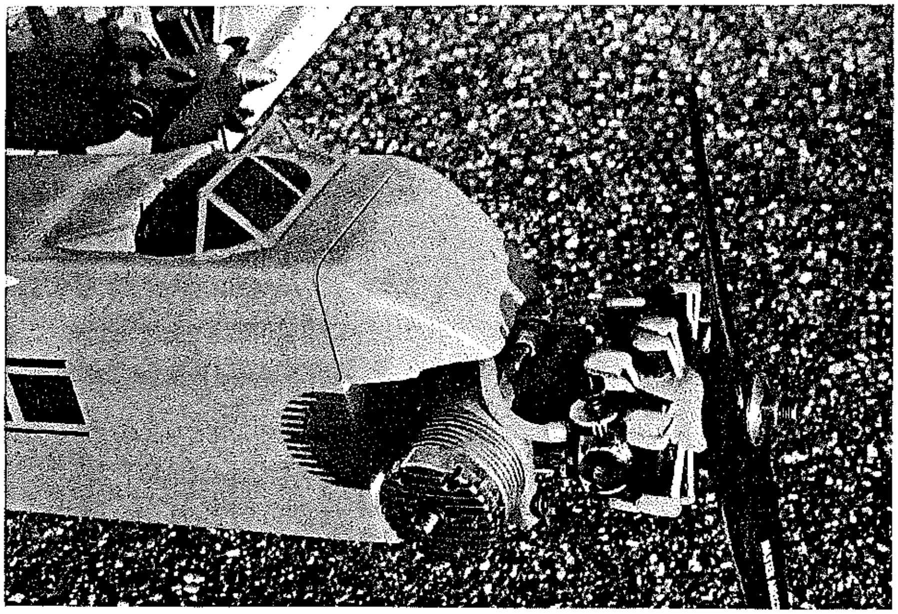
Where there is madness, there is often a method. This picture shows the results of many a sleepless night. It takes 42 dummy cylinders to make the three 14-cylinder radial engines. That translates into 84 pushrods! It's not as bad as it sounds, though. Two evenings brought the trio together ready to install. The crankcases are 1/64 plywood tubes glued to a sheet front piece. The Peck dummy cylinders are CyA'd to the strip of balsa which forms the cylinder heads.



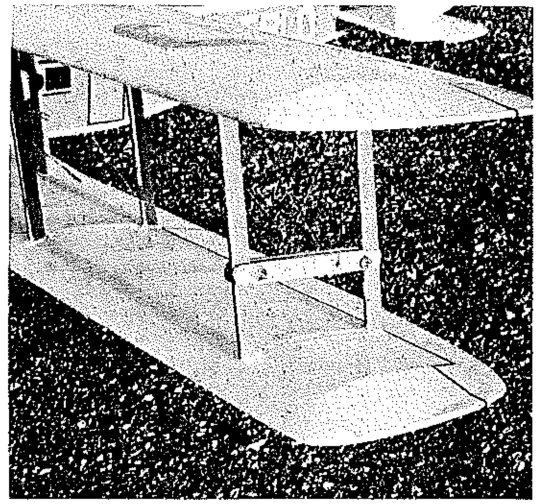
A clamp-on lead-out guide gathers all three lines at the last set of wing struts. Thread the lines from the top, through the slot between the sides of the clamp, then individually lead through the notch and small cuts to the guide hole—like threading a sewing machine.

Full-Size Plans Available . . . See Page 188

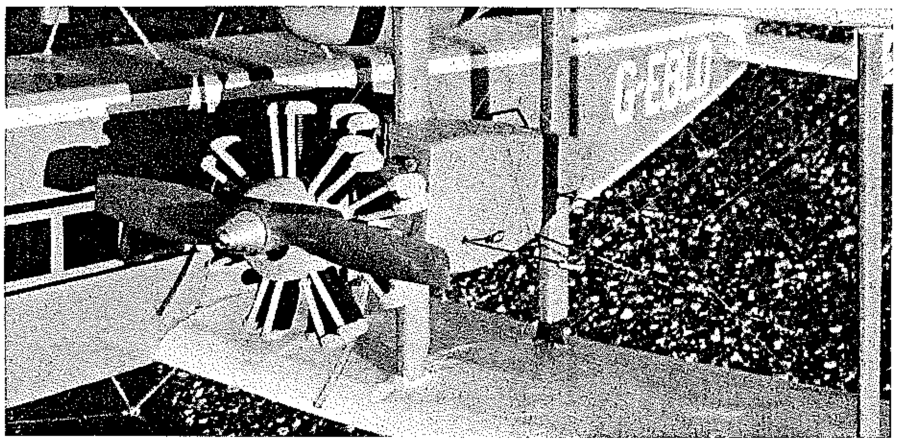




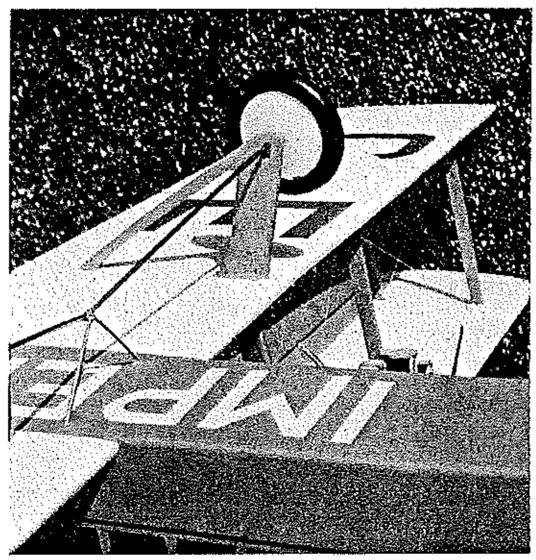
The main engine looks like it's being eaten by a hungry fish. The Argosy is clearly an airplane that stretched utilitarian technology. The open cockpit, exposed control wires, and uncowled engines would make a modern passenger wilt from 50 ft., yet it was known for its reliability.



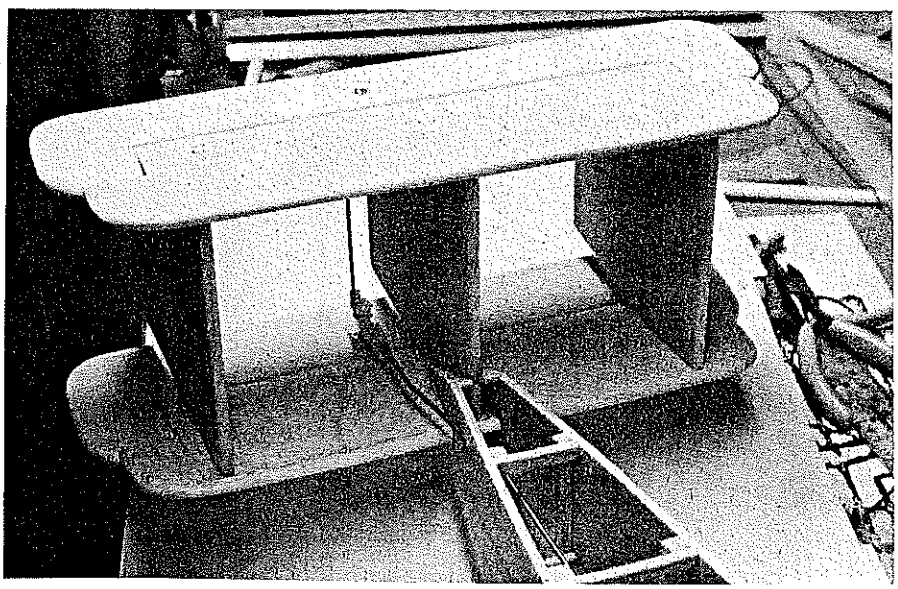
All three control lines exit the same hole in the lead-out guide. When you're done flying, the clamp-on guide can be removed and stored with the lines for better appearance.



The scale engine all but conceals the Cox .049 in the nacelle. A plywood core inside the nacelle serves as a bushing for the lead-outs. The Cox engines give the Argosy a distinctive sound. They are mostly there for the sound, as the main engine is sufficient to fly the model.



Note the notch for the shock-absorbing axle. The wire axle is over-bent before assembly and soldered to the pylon strut at the center. The wire's bend will support the weight of the model. Any additional pressure will be taken up in the travel allowed in the slots.



Let's see, two stabilizers, two elevators, three rudders, and three fins; yep, it's all here. You could almost build two models from all the parts in the Argosy. Note location of pushrod exit.

cylinder off the strip, leaving $\frac{1}{8}$ in. on the top of the cylinder for the head. (Be sure you make the $\frac{1}{8}$-in. heads at the *same* end of each of the cylinders.) A fingernail file was enlisted to sand the flush end, rounding it off to match the plastic cylinder; a round file was used to finish off the cylinder heads. This step was repeated for all 42 cylinders.

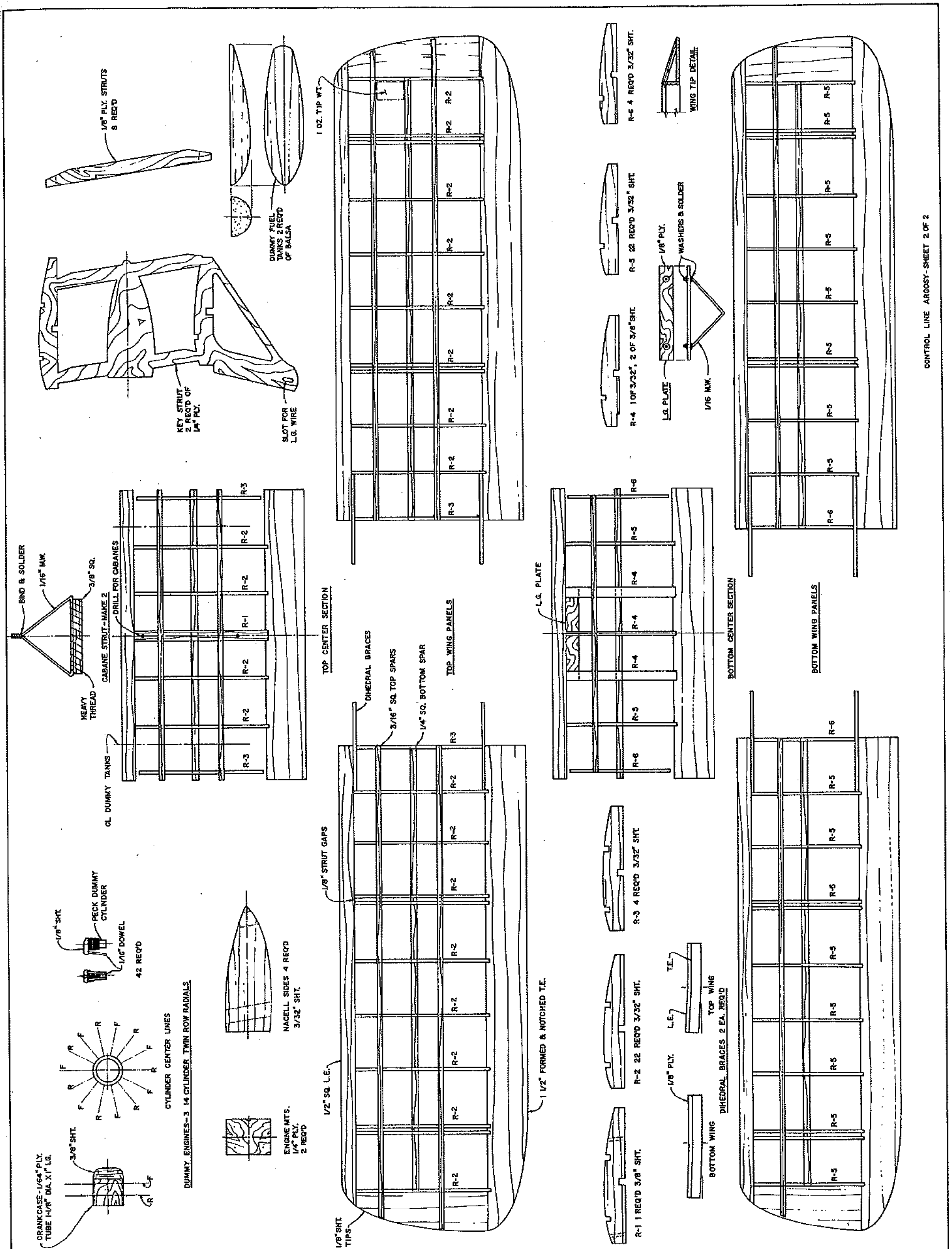
The dummy crankcases were built up using a rolled tube of $\frac{1}{64}$ plywood, $1\frac{1}{8}$ in. in diameter; they have a $\frac{3}{8}$-in. sheet balsa end. Sand the balsa to shape, then drill the dummy crankcases for adequate clearance of the model engine's crankcases. Lay the crankcase on the plan, and transfer the cylinder centerlines to the ply. The lines marked 'F' are for the seven front-row cylinders; those marked 'R' are for the seven in the rear.

Sand the bases of the cylinders to rest neatly on the crankcase before gluing them. My homemade sanding tool consisted of a piece of sandpaper attached to a $1\frac{1}{8}$-in.-dia. paint bottle. Begin gluing operations with the back row of seven cylinders. When these are dry, cut the rocker arms from round toothpicks, and glue two of them to each cylinder.

At this point, access to the crankcase for painting around the cylinders and the rocker arms is easy. A light gray or silver hue is perfect.

Glue the front row of seven cylinders and their rocker arms onto the crankcase, and

Continued on page 176


CONTROL LINE ARGOSY-SHEET 2 OF 2
TOP WING PANELS
BOTTOM WING PANELS
TOP CENTER SECTION
BOTTOM CENTER SECTION
CABANE STRUT-MAKE 2
DUMMY ENGINES-3 14 CYLINDER TWIN ROW RADIALS
CYLINDER CENTER LINES
WING TIP DETAIL
DIHEDRAL BRACES 2 EA. REQ'D
L.G. PLATE
1/8" PLY. STRUTS 8 REQ'D
KEY STRUT 2 REQ'D OF 1/4" PLY.
SLOT FOR L.G. WIRE
DUMMY FUEL TANKS 2 REQ'D OF BALSA
1 OZ. TIP WT.
NACELL SIDES 4 REQ'D 3/32" SHT.
ENGINE MTS. 1/4" PLY. 2 REQ'D
R-1 1 REQ'D 3/8" SHT.
R-2 22 REQ'D 3/32" SHT.
R-3 4 REQ'D 3/32" SHT.
R-4 1 OF 3/32", 2 OF 3/8" SHT.
R-5 22 REQ'D 3/32" SHT.
R-6 4 REQ'D 3/32" SHT.
1/2" SQ. L.E.
1 1/2" FORMED & NOTCHED T.E.
1/8" SHT. TIPS
1/8" STRUT GAPS
DIHEDRAL BRACES
3/16" SQ. TOP SPARS
1/4" SQ. BOTTOM SPAR
CL DUMMY TANKS
DRILL FOR CABANES
BIND & SOLDER
1/16" M.W.
3/8" SQ.
HEAVY THREAD
WASHERS & SOLDER
1/16 M.W.
1/8" PLY.
TOP WING
BOTTOM WING
L.E.
T.E.
PECK DUMMY CYLINDER
1/8" SHT.
1/16" DOWEL
42 REQ'D
CRANKCASE-1/64" PLY. TUBE 1-1/8" DIA. X 1" LG.
3/8" SHT.

I was about to suggest that you buy your control lines in bulk from somebody like Bear Manufacturing, but I noticed among the new AMA rules proposals that there's a possibility of going to .021s in Fast and Slow, along with .40-size engines, and you FAI guys will just love it if the FAI noise rule goes into effect for the 1990 World Champs. A good part of the civilized world isn't going to put up with your engine's noise any more, so it might be quiet in the Nineties.

I've always felt that you use a muffler if you need one, but it really puts people at a disadvantage at local meets not using a muffler rule if they have their planes set up to meet the tougher noise limits on the international scene.

Steve Sacco sent me a note concerning the safety thong issue. His point was that when a model flies across the circle it's gonna jerk a lot harder than if you just let the handle fly loose. No argument from me on this one, so let's all use wide safety thongs or get someone to design a good one for us to buy.

I still think a plane flying loose is more danger than is potential damage to someone's wrist or arm. At least the flier is the one who is hurt and not some innocent bystander. I did some work in Johnson's Not-So Scientific Testing Lab and found that I can break .018 lines every time with a good jerk. The difficult part was trying to break both lines at the same time. I had the lines fixed to a solid object, so it might be harder to do in a model where there'd be more flex in the control system, bellcrank, and a full 60 ft. of lines. WAM *(Western Associated Modelers—RMcM)* has used safety thongs for many decades without any problems I've heard of, and several AMA meets in which I've flown required safety thongs because they were flown at airports.

If you have pictures of your latest creation, please send them immediately so we can have a spring gallery of Combat models. You might also comment on what you think your chances are during the Combat season, but I'll do a follow-up in the fall, so don't get too carried away boasting about your world-beater.

CL Navy Carrier/Perry

Continued from page 65

used an OS carburetor and a K&B exhaust baffle and was swinging a Rev-Up 9 x 7 prop. Glenn's MO-1 had a span of 37.5 in., a wing area of 275 sq. in., and weighed 3 lb., 3 oz.

High speed of the event was held by Pete Mazur at 112.7 mph, but he was unable to finish a low speed. Pete's 3 lb., 12 oz., 355 sq. in. MO-1 was powered by a Webra Speed .61 using a fuel meter carburetor and exhaust slide with a pressure fuel system. Prop was a fiberglass copy of the Rev-Up 10 x 8W. Other models that achieved speeds in excess of 90 mph were powered by an almost even mix of large (.60 to .65 cu. in.) and small (.41 to .46 cu. in.) engines (four large, three small).

While there was an equal mix of large and small engines throughout the entries, the same distribution did not exist among those who completed high-speed flights. All of the large engines which successfully completed high speed were over 90 mph. However, small engines greatly outnumbered large engines for finishing high speed (four large, eight small). The larger engines were usually equipped with pressure fuel systems, and some of them suffered from reliability problems. Many of the smaller engines were equipped with suction fuel systems and stock throttles and seemed to be more reliable. Reliability of complex systems is usually directly related to the amount of time and practice the contestant can devote to the event.

Best low speed of the day went to the author at 158 sec. (11.3 mph). Glenn Simpson was close behind at 11.6 mph. As in Class I, increasing wing loading correlated very closely with increasing speed during slow flight.

As in the past, the dominant glow plug was Fox. The propeller used by most of the contestants was Rev-Up. The most popular size in Profile and Class I, as well as the smaller-engined Class II models, was the 9 x 7.5, with the 9 x 7 also popular.

That's all for this month. As you read this, I hope that you are well along in the building of your models for next season. The snow will be melting here in a month or two, and I'm looking forward to using the vast expanse of parking ramp here at Griffiss Air Force Base for practice.

Argosy I/Haught

Continued from page 70

paint. Repeat these procedures for all three dummy engines. Too much work, you protest? Not when the results are this terrific looking. Check out the photos again, and see if you don't agree.

Fuselage. Cut the fuselage sides from stiff sheets of ⅛-in. balsa. Glue on the plywood doublers and the corner blocks. Cut out the formers and the ¼-in. plywood firewall. All the formers from A to C are identical in shape and differ only in their material.

Select your engine mount, and drill the necessary holes in the firewall. Add the blind nuts to the back side of the engine mount, and drill the holes for the fuel tank tubes. I used an RC clunk tank, which fit nicely in the nose right up against the firewall.

Set up the fuselage sides, align formers A through C over the top view, and glue together. Check that everything is square. When dry, fit the fuel tank, add some sheet balsa for its floor and ceiling, and block the tank in place so that it won't move. Cut out the plywood bellcrank mount, and bolt a three-line bellcrank onto it.

Mount the main engine temporarily, and route the throttle pushrod between the engine and the bellcrank. Pull the tail together. Make the rear open formers, and glue them in place.

After retrieving the tail assembly from under the weeks' accumulation of dust, install the elevator horn and make the elevator link parts. Make sure the elevators remain parallel to each other when they are moved. Carefully align the tail assembly onto the fuselage, and glue securely.

Bend the main pushrod to fit between the bellcrank and the elevator. Before making the final connections, drill two strips of 1/16 plywood with clearance holes for the pushrod wire. Slide them onto the pushrod, and install the pushrod into the fuselage. These tabs will be cemented into place later to act as pushrod bushings, which prevent the rather long pushrod from bowing under compression.

When all the linkages are fitted correctly, locate and drill the necessary holes in the fuselage side for the lead-outs. After installing the lead-outs, replace the bellcrank and glue the ply bellcrank mount into place.

Trim the bottom of the fuselage to fit the lower wing, and add the tail skid assembly. Sheet the fuselage bottom with balsa. Bend the two cabane strut wires, and solder them at the top. Cut a length of 3/8-in. hard balsa the width of the fuselage interior, and wrap the strut wires to the cabane wires.

Fit the wires into the fuselage. Before gluing them in, pin the lower ring to the fuselage, insert the key struts, and position the top wing. Clamp the assembly together with clothespins, and check the angle and location of the cabanes. They should fit nicely into the holes drilled in the top center of the upper wing. Once you're satisfied with the fit, glue the cabanes in. Give the control system a final check, and plank the top of the fuselage.

Cut and carve the nose blocks. Make sure there is clearance around the engine and that the throttle linkage can travel freely. Carve the headrest, and glue it in position.

Covering, final assembly, and finishing. Seal all the exposed wood with a few coats of thin dope. Cover the wings with a heavyweight silkspan, using a light silkspan for all the sheet wood. Brush all surfaces with six coats of clear dope.

Let's assemble the beast. Using epoxy for a super-strong joint, begin with the fuselage and lower wing. Continue with the key struts and finally the upper wing. Check all the angles, and check the wing alignment. Examine everything for squareness and parallelism. Measure the gap between the trailing edges and the leading edges of each wing; you should get identical figures. Finally, add the interplane struts.

While that assembly is setting up, bend the main landing gear axle. By overbending the center bend, the landing gear will be prestressed when soldered in place, giving it a shock-absorbing effect. Slip it into the slots in the bottom of the key struts, bind the center to the lower pylon, and solder well. Add the washers and vintage wheels, but leave adequate space on the axle for the wire to travel in the slot. Glue the dummy fuel tanks to the upper wing.

I chose the color scheme in Munson's book for a vivid effect. It's a bit of an undertaking, especially with all the lettering involved, but here again the effort pays off.

I purchased a set of dry transfer letters. Placing them on a sheet of white paper, I used an enlarging copier to blow the letters up to the sizes needed for the wings, rudder, and fuselage sides and bottom. Once I had the sizes I wanted, I cut them out of MonoKote trim sheets in the appropriate colors.

The wire rigging can be eliminated if you wish. I used some ½A Speed wire that was lying about. Monofilament would also work

Continued on page 180

Argosy I/Haught
Continued from page 177

well. The basic rigging pattern is shown in the plan.

Your final challenge is to run the lead-outs through all this maze. Use a sharpened piece of music wire to hand drill the necessary holes for the lead-outs through the nacelle. The lead-outs on the prototype extend a few inches beyond the nacelles, which makes for a less cluttered looking model.

The lead-out guide clamps onto the last set of interplane struts and is added only for flying. The parts for making the guide are shown on the plans. The two long plywood strips are glued together with a space between. Notice that the line hole is identical on both strips, but that the slots leading to the holes are different. On the front strip the slot exits at the bottom, while on the back strip it exits at the top.

Clamp the lead-out guide to the wing strut so that the line hole is about 1¼ in. above the lower wing. The flying lines are individually slipped between the strips in the gap that the spacer provides from the bottom side. Lead the wire through the slots into the hole from the front and then from the back. Repeat these steps for all three lines. This is a lot easier to do than to explain, and it works well. Still, if you happen to be less vain about your biplanes than I, you might elect to simply glue the guide in place and have done with it.

Add the engines, and check the thrust angles of each. I like the super-reliable Cox .049s for the outer engines because they're easy to start and manage. For the main engine, I used a K&B .40 RC, which has more than enough reserve to fly the Argosy on its own. Test run your engines, balance the model, and you're set for the flying field.

Twin engines are a lot of fun. Triples are even better. Care must be taken during the starting procedure. I recommend that you remove the dummy engines before fueling the three engines and giving them a warm-up run. After topping off all the tanks, start the engines in sequence: the outboard engine, the inboard one, and then, *very* carefully, the main engine. Before takeoff, I refill the running .049s, using a long extension filler of plastic tubing. The Argosy will take off with all three engines set at low throttle; the main throttle is increased only for touch-and-goes and in windy conditions.

One thing's certain. Flying a piece of aviation history is a lot easier than trying to reconstruct it in your imagination. Having approached the Argosy from both angles, I can vouch for it. Enjoy your piece of 1926. I surely have!

FF Duration/Kruse
Continued from page 73

rewarded by the return of Rocket power in its new form, the Jet-X 50-Z motor. The new motor seems to be identical to the old Jetex 50 Hell-Cat, except that its nozzle orifice has been enlarged, and the ash screen on the inside has been omitted. So, too, has the old asbestos/paper gasket been exchanged for one which appears to be of a rubber composite.

How well the new motor performs is still a matter of conjecture in many circles. Some modelers report difficulty with the ignition sequence as described in the product literature, while others report no problems and seem to be very pleased with their motors.

Available thrust has also been largely a matter of conjecture at this point. The advertising literature claims that it is "more powerful and longer running." Thanks again to Fritz Mueller, we are able to chart the average thrust and duration of the new motor. What is being shown by the dotted line in Figure A is the thrust characteristic of one 12-in. loop of ⅛-in. rubber wound 250 turns and turning a 6-in. plastic prop. The solid line is the average thrust of one new Jet-X pellet burned in the new motor. *(The instructions supplied with the Jet-X warn that the* new *fuel pellets are NOT to be used in the* old *Jetex motors. RMcM)* Note that unlike the rubber thrust curve, which tends to decrease in almost a straight linear fashion, the Jet-X thrust curve tends to increase throughout the flight to a maximum of 10 grams of thrust approximately 12 seconds into the flight before dropping off at burnout.

My own experience bears out Fritz's analysis, as I watched my sheet balsa Jet-X design start to