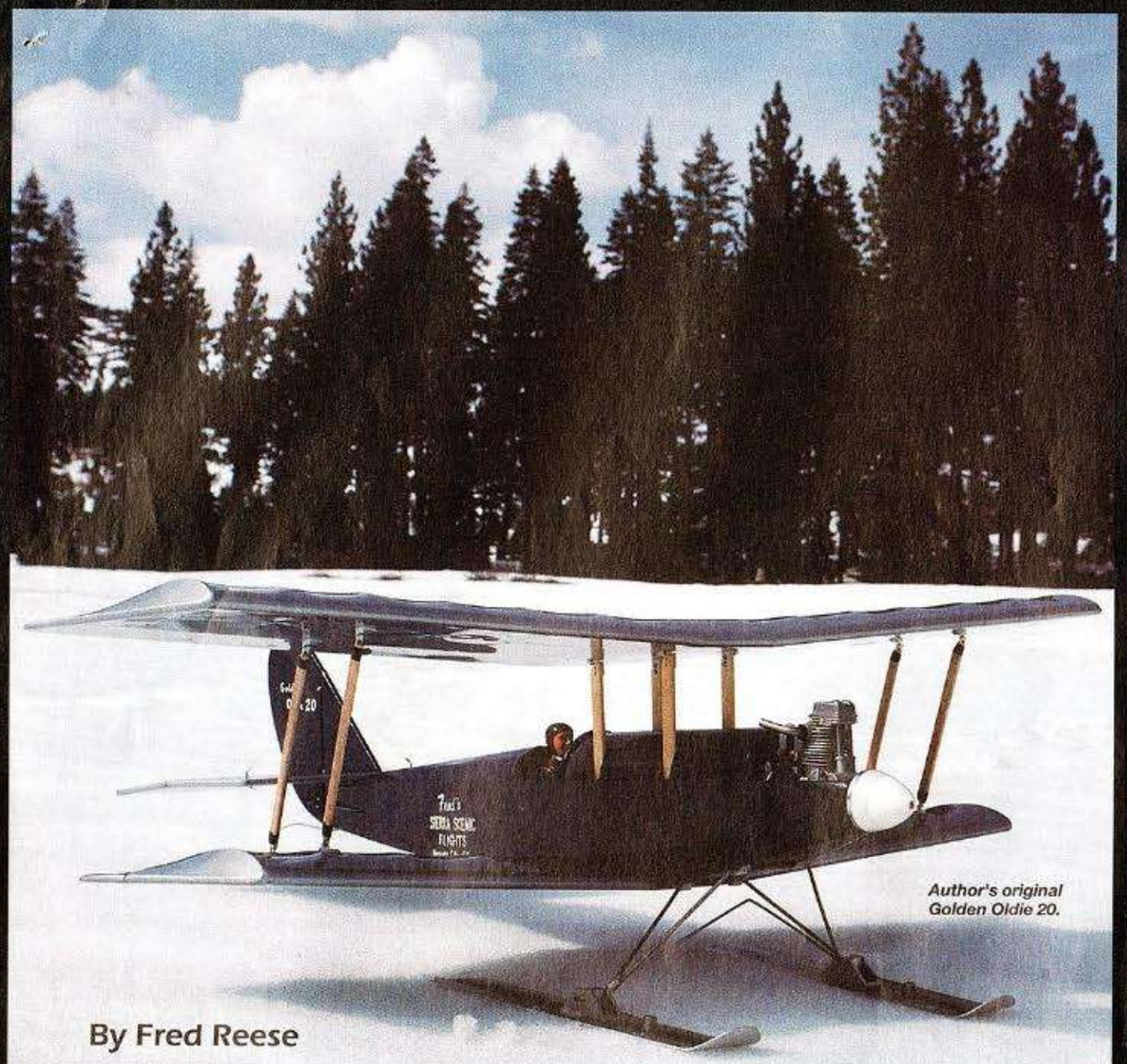


Author's original Golden Oldie 20.

By Fred Reese

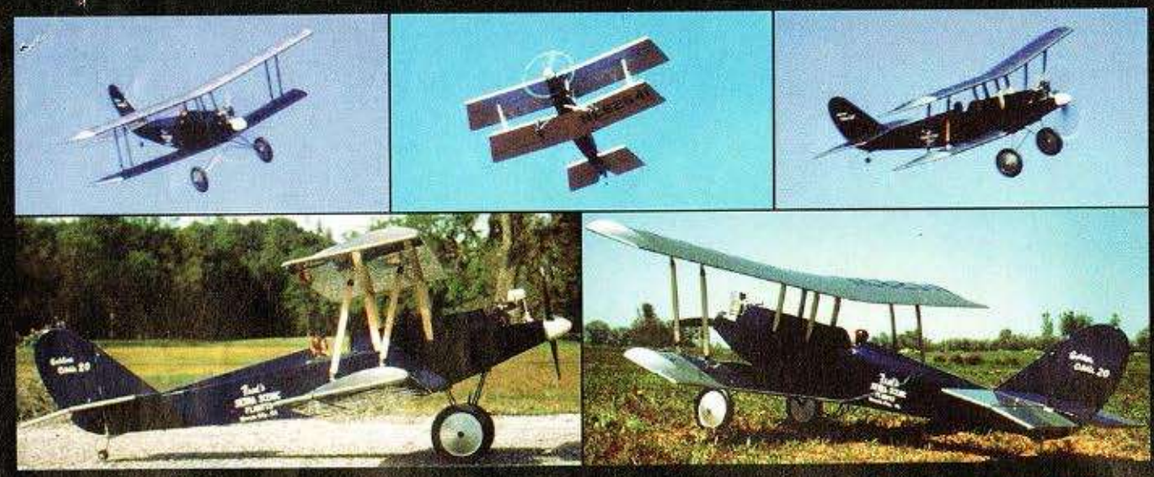
The Golden Oldie 20 is a mix of a Jenny, a Waco, and a Travel Air, and represents the best of the roaring 20's. Let's go back to the days of grass fields, barnstorming, and the sound of the wind in the wires.

Everything old is new again. Sometimes it's true. The Golden Oldie 20 is a new version of an old model, which was a new version of the old airplanes of the 1920's. Many modelers built Golden Oldie, RCM plan #897, the original. I flew mine for several years from land, snow, and water. The new Golden Oldie 20 has the same old biplane appearance and flight characteristics of the original and it is perfect for the little O.S. 20 and Surpass 26 4-stroke engines.

The old biplanes are not at all like the modern biplanes. The Ultimates and Pitts Specials of today are aerobatic machines with symmetrical airfoils and powerful engines. The old aircraft had flat-bottomed airfoils and engines of limited power. They flew on their wings, not on the props. Lazy chandelles and barrel rolls are characteristic of the old aerobatics. Lomchevaks and Humptybumps came much later. As a model, the Golden Oldie 20 fares much better than the vintage aircraft because the model

1920'S STYLE SPORT BIPLANE FOR .20-.25 SIZE ENGINES

GOLDEN OLDIE 20



DESIGNED BY
Fred Reese
TYPE AIRCRAFT
Vintage Sport Biplane
WINGSPAN
39 Inches
WING CHORD
7-1/2 Inches
TOTAL WING AREA
515 Sq. In.
WING LOCATION
Biplane
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
1" Bottom — 1-3/8" Top
OVERALL FUSELAGE LENGTH
35 Inches
RADIO COMPARTMENT SIZE
(L) 11" x (W) 3" x (H) 3"

STABILIZER SPAN
15 Inches
STABILIZER CHORD (inc. elev.)
7 Inches
STABILIZER AREA
102 Sq. In.
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top Of Fuselage
VERTICAL FIN HEIGHT
5-1/2 Inches
VERTICAL FIN WIDTH (inc. rud.)
5-1/2 Inches (Approx.)
REC. ENGINE SIZE
.20-.26 4-Stroke, .25 2-Stroke
FUEL TANK SIZE
4-6 Oz.
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
4

CONTROL FUNCTIONS
Rud., Elev., Throt., Ail.
C.G.
3" From L.E.
ELEVATOR THROWS
1/2" Up — 1/2" Down
AILERON THROWS
3/8" Up — 1/4" Down
RUDDER THROWS
1-1/2" Left — 1-1/2" Right
SIDETHRUST
2° Rt.
DOWNTHRUST
3°
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa & Ply
Wing ..... Balsa, Ply & Spruce
Empennage ..... Balsa
Wt. Ready To Fly .. 56 Oz. (3 Lbs. 8 Oz.)
Wing Loading ..... 16 Oz./Sq. Ft.

Red and yellow model is by Art Cummins of Nevada City, CA. Art's Golden Oldie 20 has longer wings. Each panel has been extended one rib bay. Art has flown his model extensively on floats.

MATERIALS LIST

1 — 3/16" x 3" x 36" balsa sheet
6 — 3/16" sq. x 36" hard balsa
4 — 1/16" x 3" x 36" medium balsa
3 — 1/4" sq. x 36" balsa
9 — 1/4" x 1/2" x 36" balsa
2 — 3/16" x 3/4" x 36" balsa
4 — 1/8" x 1/4" x 36" spruce
2 — 1/4" x 1/2" x 36" spruce
2 — 1/8" x 1/4" x 36" balsa
1 — 1/4" x 2" x 36" balsa
1 — 1/8" lite ply 6" x 6"
1 — 1/8" aircraft ply 6" x 6"
1 — 1/16" plywood 1/2" x 1"
1 — 3/16" plywood 6" x 6"
1 — 3/16" dowel 4"
1 — 1/4" dowel 4"
1 — 1/8" piano wire 36"
1 — 1/16" piano wire 18"

Hardware

3 pkg. C.G. angle hold-downs #464
1 pkg. C.G. 1/8" landing gear clamps #286
3 pkg. C.G. small control horns #440
1 — C.G. tail wheel bracket #460
2 — 1/8" wheel collars
1 — 1/16" wheel collar
4 — 4-40 x 3/4" bolts and blind nuts
4 — 6" threaded rod and clevis
2 — Solder links Du-Bro #112
1 pkg. C.G. 1/16" aileron pushrods #351
1 — C.G. strip aileron horn set #402
3 pkg. Du-Bro EZ Connectors (6) #121
1 — Sullivan SS-4 fuel tank
1 — Dave Brown engine mount #202L
1 — 2" spinner
1 — 1" tail wheel
1 pr. Williams Bros. 3-3/4" vintage wheels
18 — Small hinges
2 rolls Covering

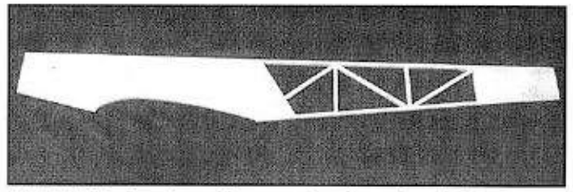
engines are much more powerful relative to the size of the airplane. Think about it, a Jenny only had 90 horsepower. Landing speed and full power differed by only a few miles per hour. The model can pull vertical and do a nice hammerhead or loop from level flight. I like both the old and the new aircraft; they are just different. The Golden Oldie 20 is at its best just boring holes in the sky and shooting landings. It just looks and feels right.

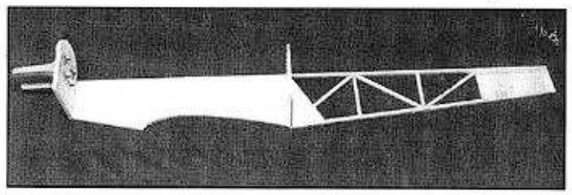
Biplane hardware and strut attachments are the old biplane's biggest problem. We want our models to be easily assembled and disassembled. We don't want to spend an hour at the field puttering around before we can fly. As a designer, I try to use readily available hardware whenever possible. The wing attachment on the Golden Oldie 20 may seem unusual, but it is simple and it works. Goldberg angle hold-downs are screwed to the top of the cabane struts with the slots facing forward. Four #2 x 1/2" screws are installed into the spruce wing joiners in the bottom of the wing aligned with the angle hold-downs. The top wing then snaps into the nylon hold-downs from the front. The wing cannot move up or backwards which are the flight loads. The wing can move forward as in the case of an impact, thus preventing the struts from breaking. The actual pull load on any of the nylon hold-downs would never exceed five pounds. The two prototypes have hundreds of flights between them with no problems. The top wings have popped off several times in rough landings, with no damage to the model.

The Golden Oldie is set up like the old biplanes with some positive incidence in the top wing. This produces a gentle stall but it also produces some climb at full power. Since I generally fly this model low and slow, only going to full power for loops and hammerheads, I don't mind the built-in climb at full power. Art Cummins, who built the red model, extended both wings one rib bay, increasing the span to 45 inches. With the increased wing area and lift, his model also required some positive incidence in the stabilizer, as the climb was excessive. He cut off the tail group and sanded the top of the fuselage to angle the stabilizer down at the hinge line. If you enlarge the wing, I would suggest 1° positive in the stabilizer.

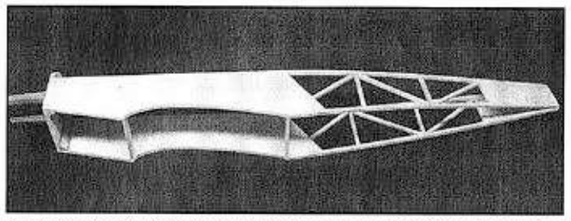
The original Golden Oldie 20 had ailerons on the bottom wing only as shown in the photographs, but was later modified to have ailerons on both wings. Art's model also has ailerons on both top and bottom wings. The ailerons on the longer wings are the same as shown on the plan, both top and bottom. An additional W-2 rib is used to lengthen the inboard portion of the wing panels. The top and bottom ailerons are connected at the trailing edge by a vertical wire with a solder clevis on one end and an adjustable clevis on the other end; these mate to cut off small control horns. The aileron linkage is in line with the outboard struts.

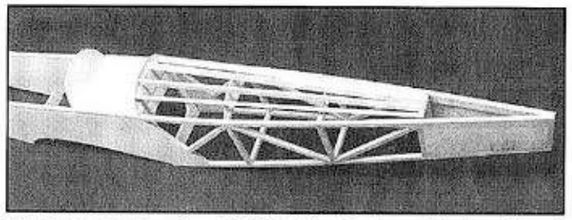
Art regularly flew his Golden Oldie 20



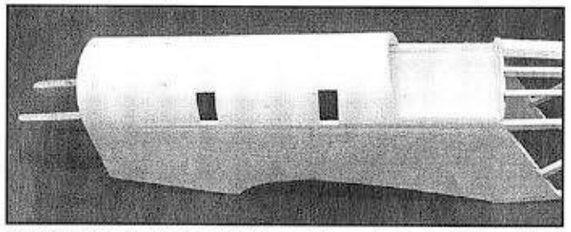


(L): Build the fuselage sides over the plan using 3/16" balsa sheet and 3/16" sq. balsa. Build the second fuselage side over the first, separated by waxed paper. (R): Bolt the engine mount to F-1 and install the blind nuts. Glue F-1 and F-3 to a fuselage side.

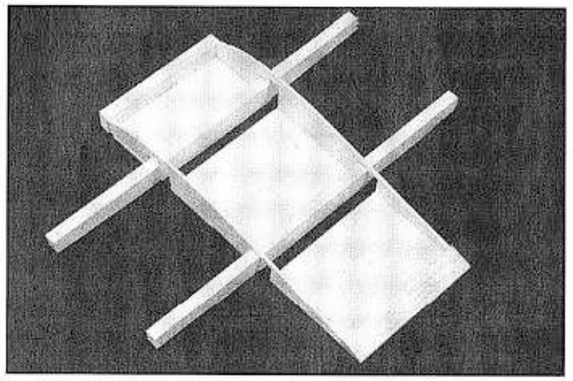


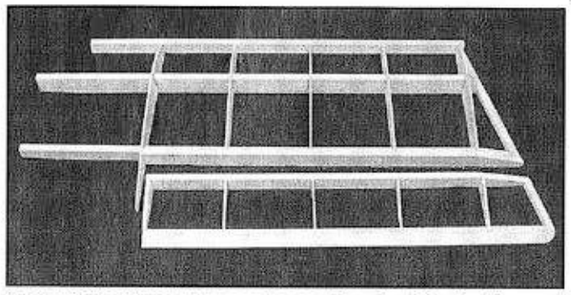


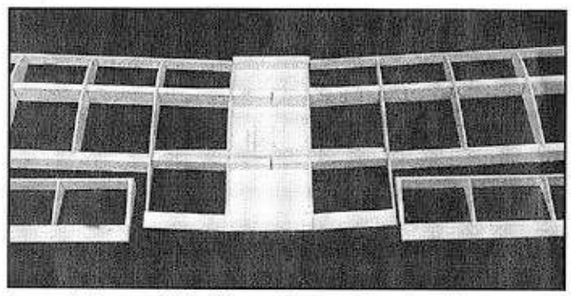
(L): Glue the second fuselage side to F-1 and F-3. Glue in the forward and rear wing mounts and F-2. Pull the fuselage sides together at the tail, and glue. (R): Glue in the 1/16" balsa cockpit floor and the 3/16" sq. cockpit sides. Glue in all of the 3/16" sq. balsa cross-pieces, top and bottom. Glue on F-4 and F-5 and the top stringers.



ABOVE: Glue in the top 1/4" sq. stringer between F-1 and F-2. Glue on the top 1/16" sheeting, starting at the sides. Bend the sheets over the bulkheads and trim off down the centerline of the stringer. RIGHT: Build two wing center sections to this point. Pin the bottom sheets down, leaving two 1/2" slots for the spars and spar joiners. Glue on the two W-1 ribs, leading edge and trailing edge. Glue in the two 1/4" x 1/2" spruce spar joiners.







(L): Build the three wing panels over the plan. The fourth panel, the lower right panel, is built over the top right plan. (R): Epoxy the wing panels to the center sections.

on floats. He used 24" homemade floats with flat bottoms and never bothered with a steerable water rudder. Based on the fuselage length, the 24" floats are a little small but they worked very well. Commercial 26" floats should work also. The floats were attached to the regular landing gear in the front and to a second wire bow at the rear. The rear wire bow was attached to a plywood plate, glued between the stringers, behind the wing. Be sure to rebalance the model with the floats in place, as the C.G. will move aft. A half-ounce in the nose of each float should be close to rebalancing the model.

If you plan to fly with floats, build the longer wings.

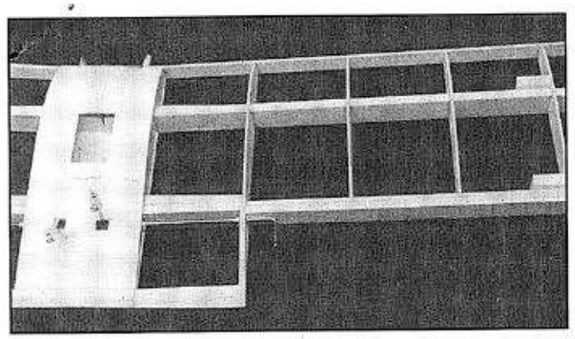
Both of the Golden Oldie 20s were originally powered by O.S. .20 4-stroke engines. The .20 4-stroke gives plenty of power and sounds great. Surpass .26 4-strokes would be even better, especially with floats. Art repowered his with an O.S. .25 2-stroke when he was flying with floats. The O.S. or Thunder Tiger .25, as shown on the plan, will fly the Golden Oldie 20 very nicely.

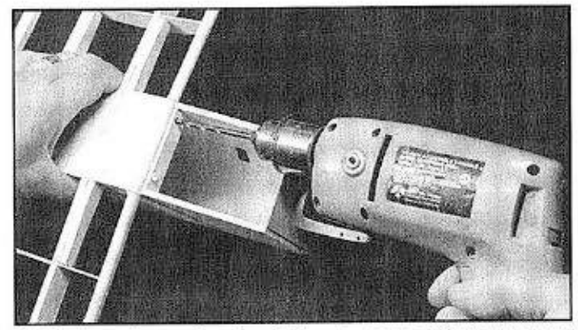
CONSTRUCTION

Fuselage

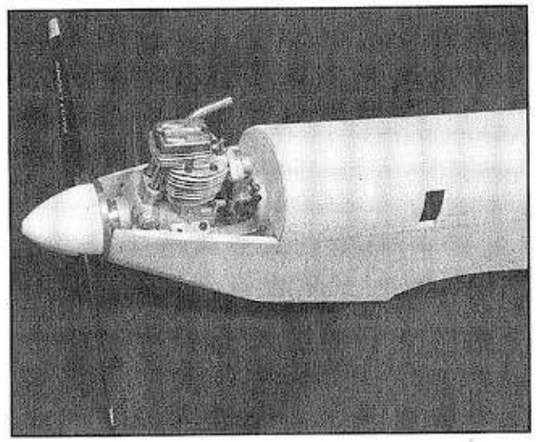
Cut out the 3/16" plywood firewall, F-1. Position the engine mount on the firewall and drill the mounting holes. Install the 4-40 blind nuts in the firewall. Drill the engine mount for the engine. Cut out the lite ply bulkheads F-2 and F-3. Cut the landing gear mounts and the front wing mount all from 1/8" aircraft plywood; these parts are all the same size. Drill the two 3/16" wing dowel holes in the wing mount.

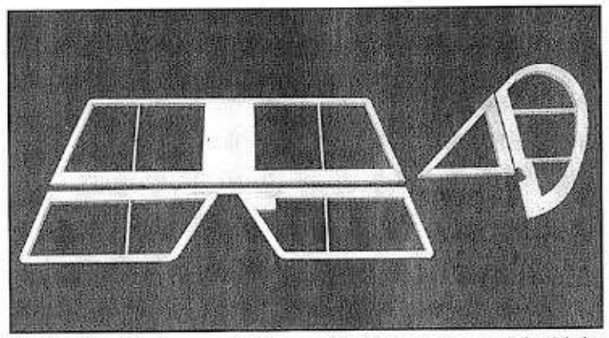
Cut out the two 3/16" balsa fuselage sides. Cover the fuselage plan with waxed paper over your building board. Pin down a fuselage side and glue on the top and bottom 3/16" sq. longerons. Either very



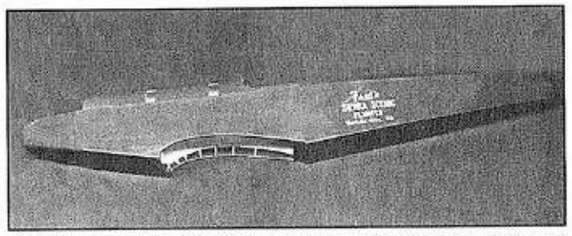


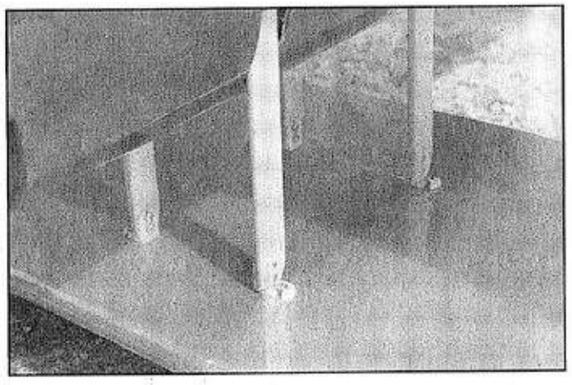
(L): Sheet the top of the upper wing center section. Before sheeting the bottom wing center, glue in the plywood leading edge dowel support. Also glue a trailing edge filler to support the wing bolts. Install the aileron linkage and then the top sheeting. (R): Fit the bottom wing into the fuselage and drill the two 3/16" holes for the wing dowels, using the holes in the front wing mount as a guide. Epoxy the dowels into the wing, then drill, tap, and install the two 1/4-20 wing mount bolts through the trailing edge.





LEFT: Glue the two cowl sides and bottom in place and add the triangle stock in the bottom corners. Trim the front of the cowl to leave a 3/32" gap between the spinner and spinner ring. Carve and sand the cowl to fair into the spinner. ABOVE: Build the tail parts over the plan from strip stock and 1/4" sheet.





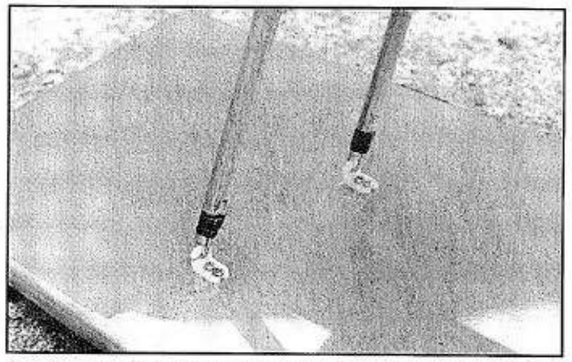
ABOVE: Cover the finished parts separately and add trim and numbers before final assembly. RIGHT: Cut the cabane struts from spruce. Shape and varnish the tops before gluing them into the fuselage. True up the ends before mounting the Goldberg angle hold-downs, which hold the wing in place. Screws in the wing snap into the hold-downs. The wing can pop off forward in a hard landing, but not up or back for flight loads. The slots face forward.

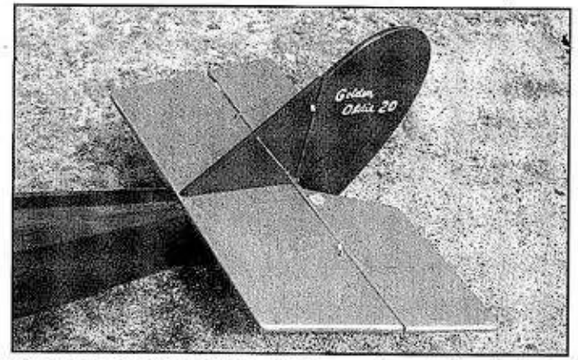
hard balsa or spruce can be used for the longerons. Cut, fit, and glue in place the 3/16" sq. balsa uprights and diagonals and the stab support. Fill in under the stabilizer with 1/16" balsa sheet. Lay another sheet of waxed paper over the finished fuselage side and build the second side over the first.

Mark the fuselage sides for the placement of the bulkheads, wing mount, and cabane struts. Glue the firewall, F-1, and bulkhead, F-3, to one of the fuselage sides using a square to keep them straight. Glue the second fuselage side in place to F-1 and F-3. Glue 1/4" triangle stock behind F-1. Glue in the predrilled 1/8" aircraft plywood wing mount and F-2. Bevel the fuselage sides at the tail a little so the total thickness at the tailpost is 1/4". Pull the fuselage sides together at the tail and glue.

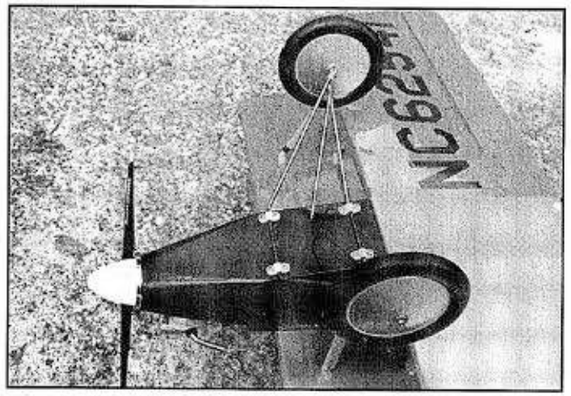
Glue the 1/16" balsa cockpit floor and 3/16" sq. cockpit sides on top of the longerons, between F-2 and F-3. Glue the top and bottom 3/16" sq. balsa cross braces between the fuselage sides at each of the upright positions. Glue a piece of 1/4" sq. balsa crossways on top of the longerons to form the rear top bulkhead. Glue on F-4 and F-5. These bulkheads are not notched and may have to be adjusted in width to match your fuselage. Glue in the top 1/8" x 1/4" balsa stringers, starting in the center.

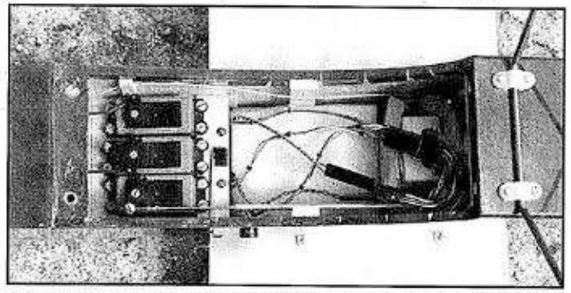
Glue in a 3/16" sq. balsa top stringer between F-1 and F-2. Glue on the top, front 1/16" balsa sheeting using lengths of 1/16" x 3" balsa sheet. First, glue the sheets to the top edge of the fuselage sides, dodging around the cockpit floor and sides. Lightly dampen the sheet on the outside, then bend over the bulkheads to the center stringer. Glue down one sheet at a time to the bulkheads and trim the sheet to the



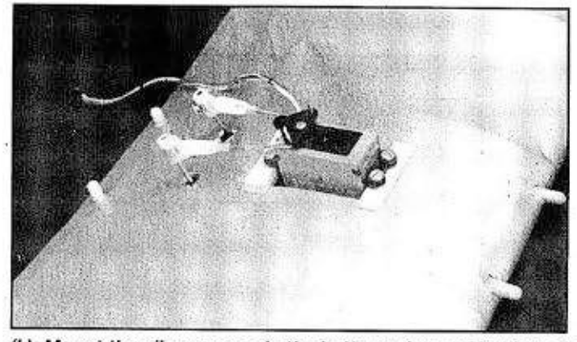


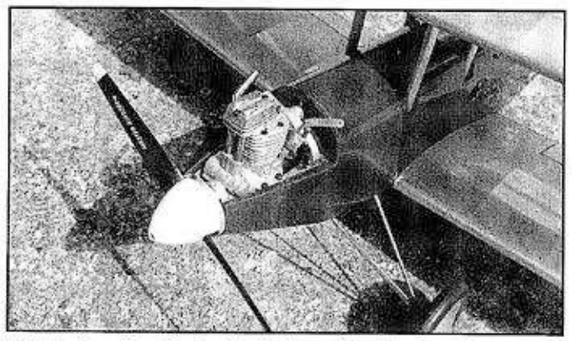
(L): The wing struts also snap into Goldberg angle hold-downs, making assembly at the field quick. Be sure to mark the struts for position, as each may be a little different. (R): Cut away the covering on the stabilizer for the glue joints. Hinge the rudder and elevator and then glue to the fuselage. The flying wires shown are made from pin hooks, monofilament, and crimped aluminum tubing.





LEFT: The 1/8" wire landing gear is secured to the fuselage with nylon 1/8" landing gear clamps. The Williams Bros. 3-3/4" vintage wheels really dress up the model. ABOVE: Position the servos and radio to balance the model after the model is assembled. Note that the switch is mounted in the front of the servos.





(L): Mount the aileron servo in the bottom wing and hook up the linkages. See the plan for the linkages that hook up the top and bottom ailerons. (R): An O.S. .20 4-stroke engine is shown on the prototype. The little 4-strokes are ideal for this model, great sound and great performance.

centerline of the top stringer. Cut out the notches for the four cabane struts.

Wings

First decide on the wing length. The plan only shows the standard length wing panels. To lengthen the wing, add one rib bay to the inboard sections of each wing panel. The ailerons are the same, top and bottom and for either wing length. Cut out the ribs from 1/16" balsa with four W-3A partial ribs from 1/8" balsa. Make the four forward spars from 1/4" x 1/2" hard balsa, capped top and bottom with 1/8" x 1/4" spruce. Bevel the top wingtip ends of the spars from the outside edge of the last rib down to 1/4" for the wingtip. Bevel the bottom of the inboard ends of the spars for the dihedral, using the plan as a guide. It is easier to plane the 1/4" x 1/2" trailing edge into trailing edge stock before building the wing.

Lay waxed paper over the plan and build each of the three panels shown. The fourth panel, the bottom right, is built over the top right plan. Pin down the two spars of a panel and glue on the wing ribs. The photos show the original top wing that I built without ailerons. Glue on the 1/4" x 1/2" leading edge, the 3/16" x 3/4" rear edge for the ailerons, and the 1/4" x 1/2" trailing edge on the panels with more than one W-2 ribs. Glue on the 1/4" sq. balsa wingtips. Note that there is no rib on the inboard end of the wing panels. The center section takes the place of this rib. Build the ailerons, rights and lefts, separately over the plan. Glue in the 1/4" x 1/2" spacer and W-5, the lite ply aileron linkage support between the inboard ribs of the bottom ailerons. The inboard W-3A aileron rib is 1/8" balsa. Be sure to glue on the W-4 partial rib doublers to support the covering at the edge of the aileron opening.

Build the two wing center sections over the plan. Pin down the 1/16" sheet balsa bottom pieces, leaving a 1/2" slot between the sections for the wing spars and 1/4" x 1/2" spruce wing joiners. Glue in 8-1/4" lengths of the spruce in the forward edge of the slots. Glue in the two W-1 ribs, the leading edge and the trailing edge. The two center sections are the same to this point.

Join the wing panels to the center sections before adding the top sheeting. Pin the centers down to the plan, over waxed paper. Glue the panels to the centers and overlap the spars with 5-minute epoxy. Block up the wingtips for the dihedral, 1" for the bottom wings, and 1-3/8" for the top wing, either length. Glue in the trailing edge between the aileron rib and the center section on the short panels. Add the top, center 1/16" sheeting on the top wing, and it is ready for final sanding and shaping. Sand off the bottom edge of the spruce joiners even with the bottom of the spars.

The center section of the bottom wing needs a little more work. Glue in the 1/8" plywood leading edge reinforcement for the wing dowels. Glue in an additional piece of trailing edge stock at the rear to support the wing mount bolts. Bend the aileron linkage from Goldberg or Du-Bro 3/32" sets. Drill holes in the W-4-W-2 ribs and notch the W-1 ribs and glue in the linkage. Slip the 1/16" plywood aileron link bearing over the wires and glue to the W-1s. Now, glue on the top 1/16" sheeting. Round off the leading edge to match the plan. Finish sanding and shaping the wings to prepare for covering. Glue in the 1/4" x 1/2" spruce outboard wing strut blocks.

Fit the bottom wing into the fuselage and drill the two 3/16" holes through the plywood wing mount into the leading edge of the wing. Epoxy in the two 3/16" dowels into the wing. Epoxy F-6, the 3/16" plywood rear wing mount into the fuselage. With the wing in place and centered, drill two 3/16" holes for the 1/4-20 wing mount bolts, through the trailing edge of the wing and F-6. Run a 1/4-20 tap through the holes and install the bolts. With the bolts removed, firm up the holes in the wing and the threaded holes in F-6 with thin Zap. Clean out the threads with the tap again.

Glue in the two 1/8" plywood landing gear mounts, flush with the bottom of the fuselage sides. Glue on the lite ply, forward/bottom of the fuselage. Install the engine mount and engine. Build the engine cowling from 3/16" balsa sides and 1/8" balsa bottom. Add 1/2" triangle stock in the bottom corners so the front can be rounded off to match the spinner ring. Sand the front of the cowl to allow a 3/32" gap between the back of the spinner and the spinner ring. Glue in the spinner ring and shape the cowl.

Build the fin and rudder, stab, and elevator over the plan and waxed paper. Join the two elevator halves with a 1/4" dowel. Bevel the leading edges of the rudder and elevator. Round off all the other edges and prepare for covering.

The Golden Oldie 20 was designed so that all of the parts can be covered before final assembly. Also apply any decoration, trim, lettering or registry numbers while the parts are easy to work on. Most of the old biplanes had two-color paint schemes like the ones shown. Go to the reference books or use your imagination. The large registry numbers are my AMA numbers preceded by NC in keeping with pre-war aircraft.

Using the plan as a guide, make the four cabane struts. The forward struts glue to the inside of the fuselage sides and bottom against the landing gear mount and wing mount. The two rear struts are glued to the inside of the sides and are cut off even with the wing saddle at the bottom. After cutting the cabane struts to length, round off the edges of the struts that are visible. Before gluing in place, varnish the exposed struts with clear gloss polyurethane. I like the natural wood color, but they could also be stained first.

Glue the struts into the fuselage with either Zap CA Plus or epoxy. With a large sanding block, even up the tops of the cabane struts so the wing will fit flat without rocking. With the bottom wing in place, place the top wing on the cabanes and check the distance between the wings where the struts will be mounted. The distance should be the same on both sides. Adjust the cabanes if needed. Screw on the Goldberg angle hold-downs to the tops of the struts with the slots facing forward. One by one, mark and drill the holes in the bottom of the top wing for the #2 screws. Install the screws so that the hold-downs fit the second hole, as it will set the position of the next two screws. The screws are in the spruce diagonal braces, not the spars. Carefully remove the wing by holding the cabanes and pushing the wing from the trailing edge.

Install the angle hold-downs into the wing strut blocks in the wing panels. Use the plan as a guide to locate and position the nylon hold-downs. Make the four outboard wing struts from 1/4" x 1/2" balsa, using the plan as a guide. Round off the edges and shape the ends. Mark each strut as to position, RF for right front, RR for right rear, etc. Stain and apply the first coat of varnish to the struts. Bend the eight wire "U"s for the strut ends. With thin Zap, glue on a wire to the bottom end of each of the struts. With the wings on, snap a "U" into the top wing hold-downs and snap the struts into position, one by one, onto the bottom wing. Position the top wire "U" on the struts. As each strut is positioned, glue the top wire in place with Zap. Each of the struts is now marked as to position and is adjusted to length. Remove the struts and wrap the ends with thread over the wires and secure with Zap. Lightly sand the struts and apply another coat of varnish.

Install the hinges in the stabilizer-elevator and fin-rudder. Trim away the covering on the bottom and top of the stabilizer for the glue joints. Glue the stabilizer onto the fuselage. Bend the tail wheel wire and mount the tail wheel bracket to the fuselage. Mark the position of the tail wheel wire on the rudder, and drill. Glue the fin-rudder to the top of the stabilizer. Hinge the ailerons to the wings and hook up the linkage to the bottom ailerons.

Bend the landing gear from 1/8" wire. Mount LG-1 and LG-2 to the fuselage with Goldberg 1/8" nylon landing gear clamps. Clean the landing gear wires with fine sandpaper where they are to be soldered. Wrap the three landing gear wires together with fine copper wire at each end, apply flux with solder. Place a washer on the axles and then the Williams Bros. 3-3/4" Vintage wheels. Secure the wheels with 1/8" wheel collars.

Drill F-1 for the fuel lines and throttle pushrod. Install the fuel tank. Attach the throttle pushrod to the carburetor and install the engine, prop, and spinner. Make the rudder and elevator pushrods, leaving the servo ends long. Cut the pushrod exit holes in the fuselage and slip the pushrods in place. Mount the control horns to the rudder and elevator and attach the pushrods. Position the radio components in the airplane as shown on the plan and check the balance according to the plan. Re-position, if needed, to balance the model, then mount the servos on plywood servo rails. Glue a strip of 1/8" x 1/4" balsa to each fuselage side to facilitate mounting the servo rails. I use a wire pull to the radio switch mounted on the forward servo rail. Mount and hook up the servos to the pushrods and the receiver. Wrap the receiver and battery in foam or bubble pack and place in the fuselage. Support the fuel tank with bubble pack or foam.

Cut the hole in the bottom wing for the aileron servo. Cut away the covering for the plywood servo mounts and glue to the wing. Mount the aileron servo and hook up the pushrods to the aileron linkage. Turn on the radio and adjust all of the pushrods to center the surfaces when the trim levers are centered. Cut down four small control horns for the aileron connector linkage. Mount a horn on each aileron in line with the outboard wing struts as shown on the plan. Make the connector linkages with a threaded rod and clevis at one end and a solder clevis at the other end. Adjust the pushrods until the ailerons are all aligned with the trailing edge with the servo centered. Recheck the control movements, neutrals and direction, charge the batteries, and it's time to fly. Whew!

Flying

Start with a 9 x 6 prop on the 4-strokes or a 10 x 6 on a .25 2-stroke engine. Now just go fly it. Take off straight into the wind. The Golden Oldie 20 should fly easily, not too fast, but with authority. It will probably climb at full throttle, so feed in some down trim if needed, or throttle back. The Golden Oldie 20 will loop from level flight and do nice hammerheads and Cuban eights, just not very high. When landing, keep some power on until the final flare-out. I hope you like your Golden Oldie 20.