GERE SPORT

Designed over forty years ago, by nineteen year old Bud Gere, Jr., the full-size Gere Sport is still an outstanding example of the highest level of true amateur design and construction. Lee Renaud's Sport Scale model of this Depression Era aircraft retains all of the characteristics of the original biplane. With a .10 or .15 engine, the sky's the limit.

Of the many hundreds of R/C aircraft that we, at RCM, have built over the years, few have given us as much pleasure as has the Stand-Off Scale Gere Sport biplane designed by our Soaring Editor, Lee Renaud.

A semi-scale model of the full size Gere, which was designed during the Depression by a 19 year old youth named Bud Gere, the full size aircraft never reached the level of popularity which the Heath Parasol and Pietenpol Aircamper enjoy. Yet, it was well designed for inexpensive home construction and for excellent flying characteristics. In fact, this 1930's era home-built was so good that it inspired the EAA biplane almost 30 years later. The original full size aircraft had all of the things that a good biplane should have including a fairly high aspect ratio, a clean, straightforward structure and large enough tail surface areas lacking on so many biplanes.

Lee Renaud's .09 to .15 R/C version of the Gere Sport retains all of the outstanding characteristics of Bud Gere's original design. The original prototype, which we had the pleasure of flying, utilized an OS Max .15 engine with stock Max muffler. As you may recall from an article entitled "Police Story" in the December 1975 issue of RCM, the Gere Sport was clocked at 64.5 mph in level flight on a police radar unit. With generous amounts of control surface deflection, this three channel sport biplane will do a few maneuvers that haven't even been named as yet! At reduced throttle, or with an .09 or .10 engine, it flies extremely realistically and can be handled by any sport flier with a minimum of stick time. The glide ratio of Lee's Gere Sport is excellent and it will slow down to almost walking speed for a landing. As a matter of fact, you might even snap a thermal or two once you've cut the power!

All-in-all, Lee Renaud's Gere Sport is an outstanding, easy-to-build biplane that will perform according to your desires. It can be slow and docile and quite realistic in flight, as befitting the original full size Gere which used a four-cylinder overhead valve 1927 Chevrolet engine, or it can be fast and highly maneuverable, all depending upon your choice of engine and amount of throws to the control surface.

So, if you like vintage type aircraft – and particularly vintage biplanes – and whether you like them hot, or slow and realistic, the Gere Sport will be one aircraft you'll enjoy for a long time to come.

And, someday, after you've finally hung it up in retirement, you'll still be reminiscing about the fun you had with this .15 powered version of the Gere Sport.

- - - - *Don Dewey*

BY LEE RENAUD

The early 1930's saw the design of many lightplanes designed for home or garage construction. Remember that Lindy's 1927 flight to Paris sparked an enormous interest in aviation in this country. Henry Ford had developed the Model A engine and Chevrolet also offered a light weight 4 cylinder engine which was inexpensive and readily available. With automobiles firmly established as the ground transportation, many young men dreamed of building and flying an airborne Tin Lizzie. This was a time of muslin and dope, cheap engines, and no governmental interference. The dream was real, the means were available and, as a result, airplanes were designed and built which are still flying 40 years later. Among the best known of these aircraft were the Heath Parasol and Pietenpol Aircamper. There were many others which deserve recognition. One of these is the Gere Sport Biplane. (Gere is pronounced "Gear-ee" as in Gary, Indiana.)

The original ship was designed by a nineteen year old University of Minnesota student in 1932 and 1933 — George (Bud) Gere, Jr. He was killed while experimenting with a powered iceboat just before completing his bipe. His father had the ship buttoned up and it was test flown by Elmer Wall, a Mohawk Aircraft Company test pilot, at Wold-Chamberlin Field, Minneapolis, Minnesota, in 1933. The ship was flown by other notable pilots, all of whom agreed that it was a fine flying ship, although under-powered with the Chevy 4. Bud had recognized this problem and recommended the lighter and higher performance Ford Model A conversion used on the Pietenpol be installed for better performance. Plans for the ship were offered and several built and flown by other enthusiasts. One was flying in Southern California during the 1960's and another was hangared at Scott's Bluff, Nebraska during the late '50's.

Designed over 40 years ago the Gere Sport is still an outstanding example of the highest level of true amateur design and construction. In fact, Paul Poberezny modernized the basic airframe 30 years later and created the EAA biplane. Quite a tribute to a teen-age boy whose talents were lost so prematurely. The layout is a classic example of proper biplane design with large tail surfaces, large ailerons, good gap-to-chord ratio and excellent span loading. Goodyear's new airwheels which were used to eliminate shock struts — an innovation at the time. Construction is very simple and straightforward — it's just a big model.

The model presented herein is a sport scale version for 3 channel flying. The basic character of the prototype has been retained, but the model is designed to simplify construction and achieve excellent flying characteristics. The cabanes, nose compartment and landing gear are greatly simplified for ease of construction. Wing dihedral is also increased for stability without ailerons. The construction photos are of Dick Kidd's airframe which uses ailerons and 4 channel control. These show how the addition of a few stringers plus scale dihedral provide very scale-like appearance. By building a dummy engine and adding the gear compression strut, the Gere Sport would be very competitive in Stand-Off Scale events.

The plans include references for additional scale data, which were used in designing the model. Construction details were also included in the 1933 Flying And Gliding Manual, if you are lucky enough to find a copy. One excellent source of data for aircraft of this period and modern homebuilts is the Experimental Aircraft Association, P.O. Box 229, Hales Corners, Wisconsin 53130. I have been a member for several years and every issue of Sport Aviation I receive makes me want to run to the drawing board and start designing a new ship. The people there are great and very willing to help modelers requesting infomation. I suggest that you address any correspondence regarding model information to the EAA c/o Gene Chase. Gene is an active modeler and has been most courteous and helpful with any inquiries.

CONSTRUCTION

Since this is not a model for the novice we

will provide general construction notes only. Start by cutting the fuselage sides and formers to shape, using the plan for correct outlines. The landing gear mount can be laminated from pieces of 1/8" ply if you can't notch the 1/4" ply on a table saw. You should also cut out the cowl blocks and empennage parts at this time. Bend the gear legs from 1/8" diameter music wire. Cut two rib templates from 1/16" ply and shape two sets of W-2 ribs, using the sandwich method. Use the ply templates to shape the nose ribs. Pull together the rest of the sheet and strip stock and the hardware items and you have a personalized kit ready for assembly.

Tail Surfaces:

1) Cut or file a notch in the rudder L.E. to clear the elevator tie. Bevel the L.E. and cut hinge slots in the fin and rudder and temporarily install the hinges. Round the edges of the fin and rudder and sand all of the surfaces.

2) Notch the elevator L.E. for the 3/16" dowel tie. Epoxy the joiner in the notch and let dry thoroughly, then cut the hinge slots in the stab and elevator and temporarily install the hinges. Round the L.E., T.E., and tips and sand. Cut out the elevator center section as shown on the plan.

Wing Assembly:

1) Separate the stacked ribs and trim 1/16" from the tip surface of the eight center section ribs (W-1) to allow for the top surface sheeting. Mark these ribs so you can identify them during construction. Pre-glue the leading and trailing edge of all ribs.

2) Cut the center section bottom sheet from 1/16" x 3" x 6" sheet. Be sure the bottom pieces are all the same width (1-7/16"). Cut the top sheeting from 1/16" x 3" x 18" sheet. Cut 8 gussets from 1/8" x 1/2" x 6" strip stock.

3) Tape the wing plan flat on your work surface and cover with Handiwrap or similar material. Note that the bottom wing is shorter in span and the center sheet is narrower than that of the tip wing. Both wings are built flat in one piece then cut apart at the center to add the proper dihedral. Since the wing construction is so simple, we suggest building both wings at the same time.

4) Pin the trailing edge in place and slip the W-2 tip ribs over the spar and glue in place to the trailing edge and spar. Check that the tip ribs are square with the work surfaces. Install the center W-1 ribs, aligning carefully, then glue all remaining W-2 ribs in place to the spar and T.E.

5) Glue the L.E. in place using pins to hold it tightly against the ribs. Fit the bottom sheet between the L.E., T.E., and spar and glue in place. Install the outboard W-1 rib. Install all nose ribs and tip gussets. Install the top center sheet and leave the wing pinned to the board until the glue is completely dry to avoid any chance of warping. Complete the second wing, if you have not built both together, following the same sequence.

6) Remove the wing panels from the work surface and sand all joints smooth. Trim the excess material protruding beyond the tip ribs. Cut the tips from 1/8" x 3" x 7⅛" sheet as shown on the plan and glue the tip blanks in place. Trim to match the rib contour when completely dry. Carve and sand the leading edge to shape — be sure that the shape is the same from tip to tip.

7) Cut the wing apart at the center and block sand the end of each panel square. Epoxy the 3/16" x 3/4" wedge to one panel, aligning the lower edge, then trim to match the upper wing contour. Lay this panel flat on your work surface and prop up the other panel so that the center joint fits tightly. Check that the tip rib is raised 3½" above the work surface. Adjust by sanding the wedge, if required, then epoxy the panel in place. Pin or use weights to hold the wing panels in place until the epoxy is cured.

8) Sand the center joint smooth and notch the trailing edge for the wire reinforcement. Epoxy wire in place and wrap tightly with 3/4" wide nylon tape using Duco Cement to secure the tape. Rub the cement through the pores of the tape with your fingertips. Build up 3-4 coats of cement allowing 10-15 minutes between coats. **Don't omit this step as the strength of the finished wing relies on the tape and wire reinforcement!**

Finish sand the wing all over and repeat steps 6 through 9 for the other wing.

Fuselage Assembly:

1) Cut 2 sets of cabane uprights and wing supports from 1/8" x 1/2" x 36" hardwood, using the plans as a guide. Pin the right side in place over the plan and epoxy the fore and aft uprights to the side, using the wing support to shim up the uprights. When dry, epoxy the wing support to the uprights, aligning carefully so that the wing incidence will be correct.

Epoxy the vertical grain nose doubler in place, then the 1/4" triangle reinforcement. Epoxy the tail post to this side and mark the positions of F-5 and the crosspieces, using the plans as a guide. Allow the epoxy to cure thoroughly before removing from the work surface.

2) Pin or tape the left side to the **outside** of this assembly so that both sides are perfectly aligned, with their outside faces together. Now, epoxy the cabane uprights in place, using the right side as a guide, and be sure that the uprights line up exactly. When dry, add the wing supports, taping to the right side to ensure proper alignment. Install the nose doubler and 1/4" triangle stock. Mark the crosspieces and F-5 locations from the right side. Shape the ends of the wing supports and then separate the sides.

3) Cut the opening in former F-5 for pushrod clearance. Lay out the engine mount holes, throttle pushrod hole, and fuel line holes in former F-1. The hole layout on the plans is correct for a Cox Medallion .15 R/C and should be revised if you use another engine. Press (4) #4-40 blind nuts into the aft face of the firewall and spot epoxy to secure. Cut two crosspieces from 1/4"' x 3/8" strip to match the width of former F-1 and F-5.

4) Epoxy F-1 and F-5 in position on the right side assembly using a triangle, or square, to ensure correct alignment. Apply epoxy to the exposed edge of the formers and place the left side assembly in place on the formers. Use weights to hold in place and be sure that the sides are properly lined up, particularly at the tailpost. Be sure the epoxy is completely dry before continuing assembly.

5) Install the 1/8" sheet cockpit floor and 1/4" x 3/8" crosspieces at former F-2. Epoxy the 1/4" plywood landing gear mount and 1/4" balsa chin sheet in place. Check alignment and allow to dry. After drying, pull the sides together at the tail and check alignment over the top view. When satisfied, epoxy the sides together at the tailpost. Install aft crosspieces.

6) Lay out and drill the four 1/8"

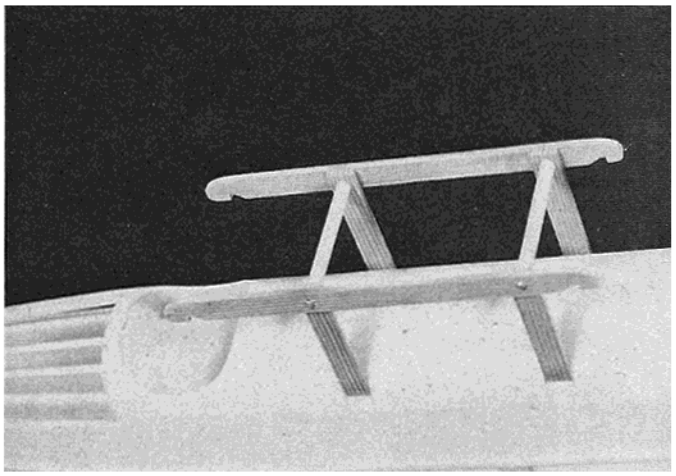
GERE SPORT

Designed By: Lee Renaud

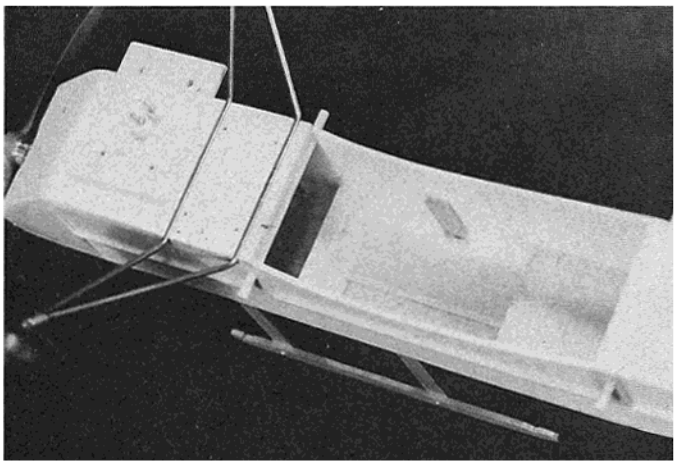
TYPE AIRCRAFT
Sport Scale
WINGSPAN
36" Top — 33¼" Bottom
WING CHORD
7 Inches
TOTAL WING AREA
485 Square Inches
WING LOCATION
Biplane
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
1¾" (both wings)
O.A. FUSELAGE LENGTH
32 Inches
RADIO COMPARTMENT AREA
(L) 8" X (W) 2¾" X (H) 2½"
STABILIZER SPAN
15⅞ Inches
STABILIZER CHORD (incl. elev.)
4⅞ Inches
STABILIZER AREA
75 Square Inches
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
4½ Inches
VERTICAL FIN WIDTH
5" (Avg.)
REC. ENGINE SIZE
.15 cu. in.
FUEL TANK SIZE
4 ounce
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
3
CONTROL FUNCTIONS
Rudder, Elevator, & Throttle

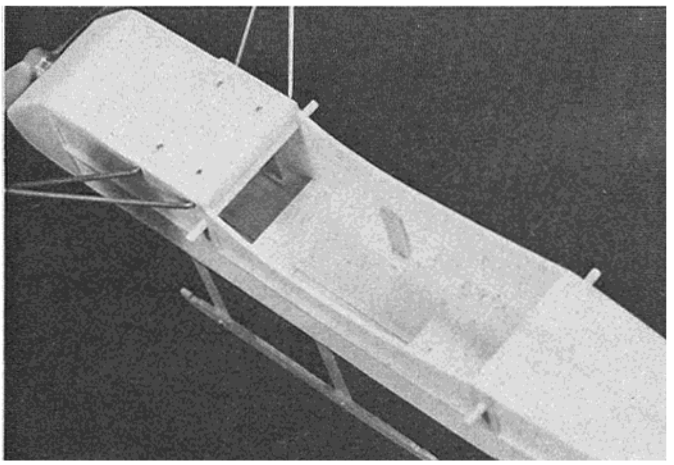
BASIC MATERIALS USED IN CONSTRUCTION

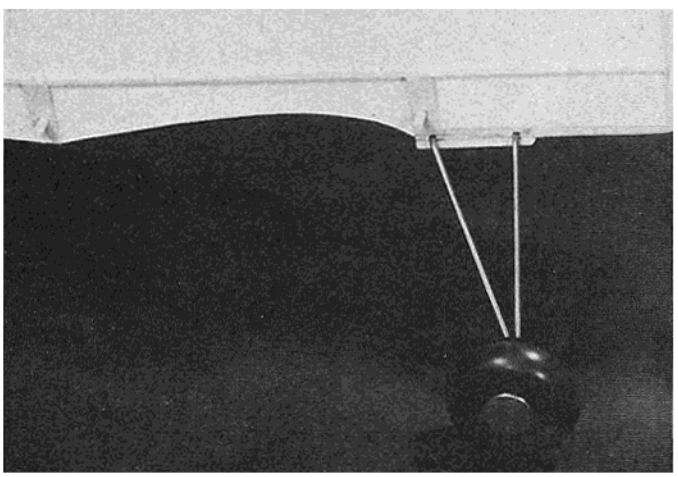
Fuselage	Balsa & Ply
Wing	Balsa & Spruce
Empennage	Balsa
Weight Ready-To-Fly	48 Oz.
Wing Loading	14.2 Oz./Sq. Ft.

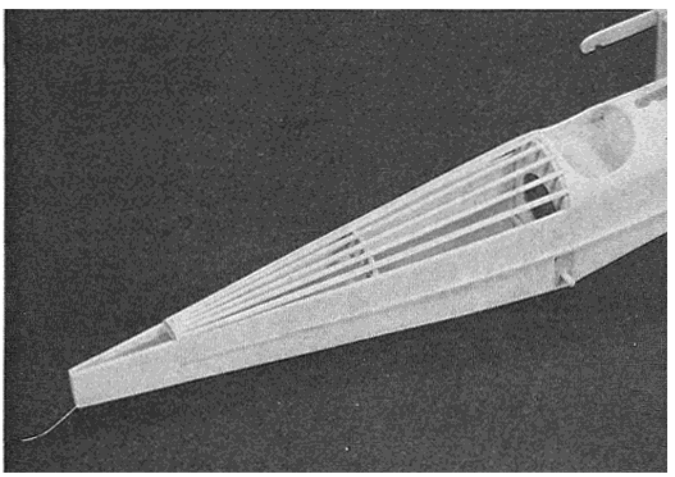


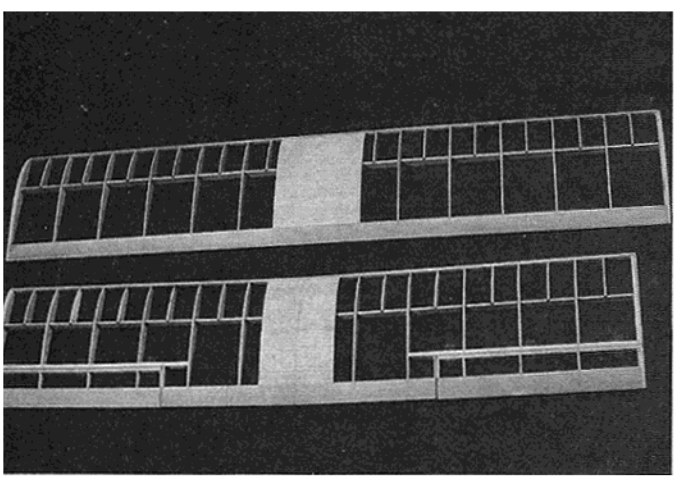
LEFT: View of the cabane struts. Cross rods prevent strut compression. SECOND ROW, LEFT: The landing gear wire in place before top plate is installed. RIGHT: Top plate screwed in place of landing gear wire. THIRD ROW, LEFT: Side view of landing gear after plate is mounted. Note wing front hold-down dowel. RIGHT: Photo of turtledeck stringers, rear hold-down dowel and tail skid. FOURTH ROW, LEFT: Top view of both upper and lower wings. Ailerons are optional. RIGHT: Bottom side of both wings with center section sheeted.

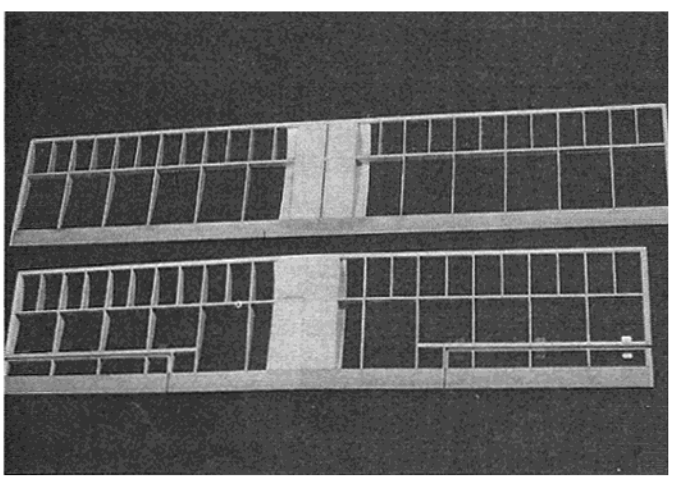




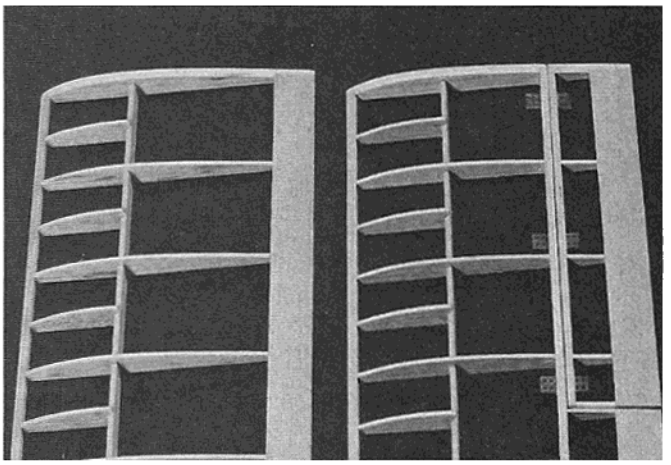


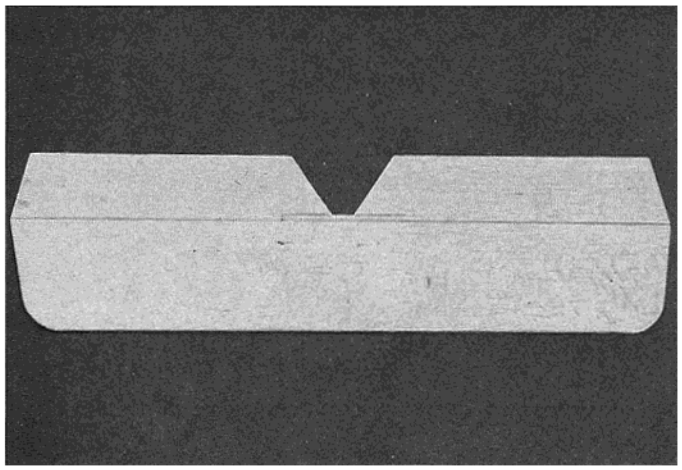


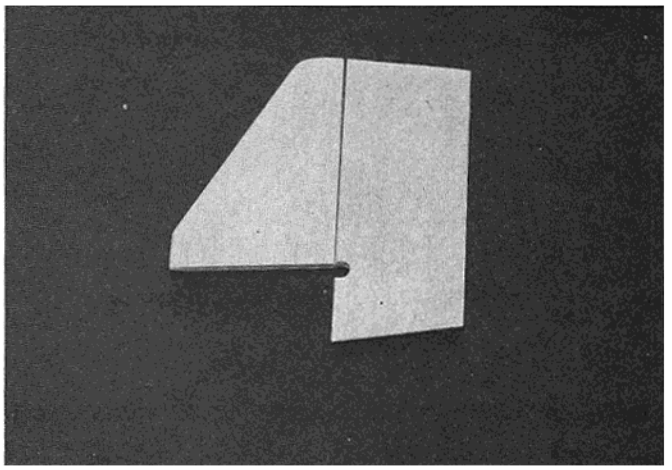


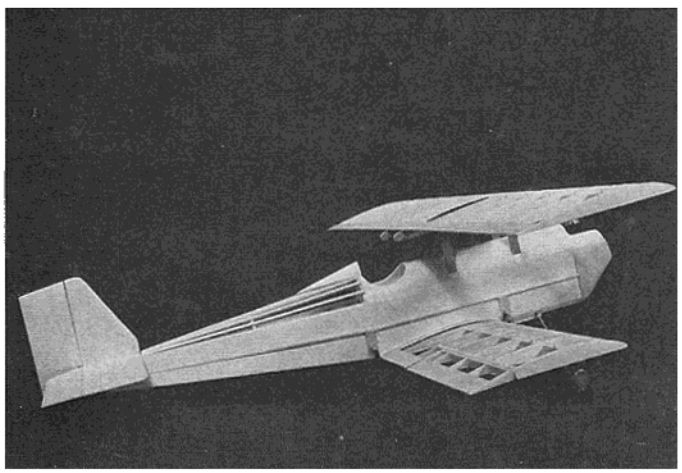


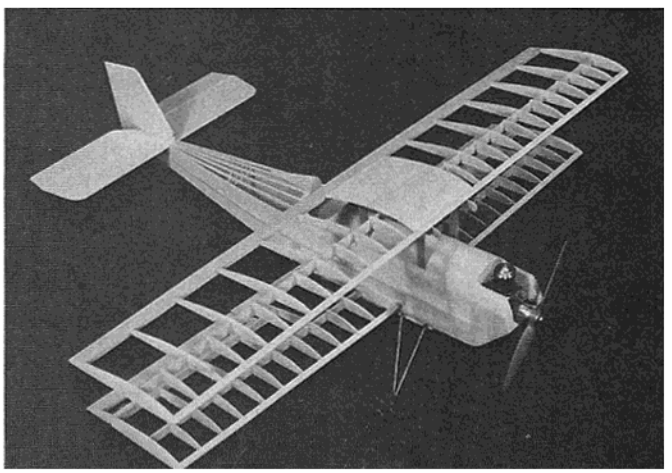
RIGHT: View of upper and lower wing tips. Again, ailerons were used on this prototype, although the Gere Sport was designed for 3-channel operation. SECOND ROW, LEFT: Horizontal stabilizer with joined elevators. RIGHT: The completed vertical fin and rudder. Note notch for elevator dowel joiner clearance. THIRD ROW, LEFT: The completed Gere Bipe, ready for covering. RIGHT: Three-quarter top view of the Gere. FOURTH ROW, LEFT: Throttled Cox .15 used in this prototype. RIGHT: Sanwa proportional system installed with servos and switch mounted on plywood tray.

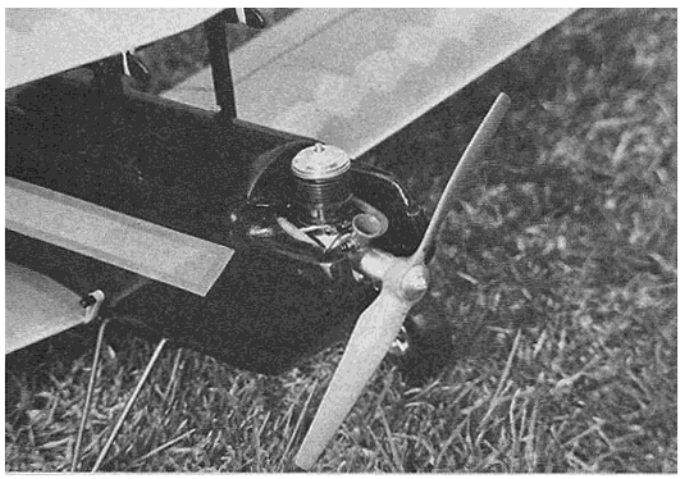


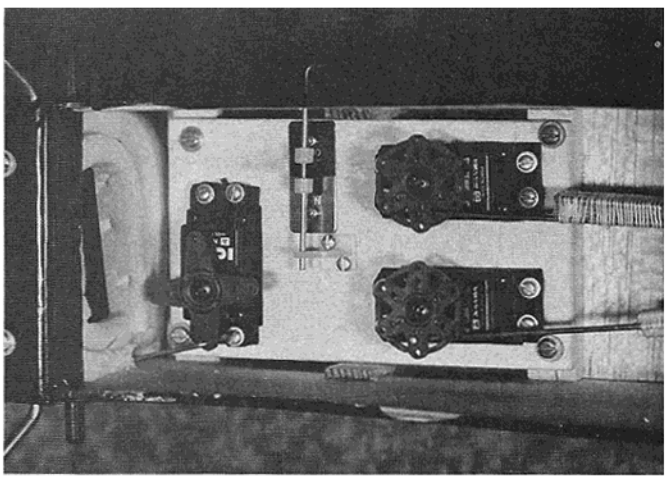












One of the Gere 3-channel prototypes, finished in black and silver Solarfilm. DJ's trim tape outlines dummy ailerons.

diameter holes in the 1/8" plywood landing gear retainer plate. Transfer the hole locations to the landing gear block and drill four 5/64" diameter holes for the #4 x 3/8" sheet metal screws. Insert the front and rear gear legs in the retainer slots and install the retainer plate and screws. Clean the gear with sandpaper and bind with soft iron wire. Check alignment and solder the struts together with a large iron and acid core solder. Be sure the joints are well soldered.

7) Drill and tap the engine mount to suit your engine. Secure the mount to the firewall with a 1/16" plywood thrust shim behind the left side of the mount, using #4-40 x 3/4" long machine screws. Mount your engine and fit the throttle pushrod. Install your tank and set-up the vent lines. It's a lot easier to do this before closing the fuselage top.

8) Install formers F-2, F-3, and F-4, and then notch all three formers for the 1/8" square top stringer. Cut and install the stringer. Align the 1/8" turtledeck sheet on the top edge of the side, with the aft edge at the joint between F-4 and F-5, and mark the position of the cabanes. Notch the sheet to clear the cabanes, working carefully to avoid cutting too much away. When properly trimmed, glue the sheet in place using tape and pins to secure. Trim the excess sheet using the center of the stringer as a guide. Repeat for the other side.

9) Install former F-6, then the 1/8" square turtledeck stringers. Butt the forward end of the stringers against the turtledeck sheet and trim the aft end to final length after assembly. Install the 1/8" square cap in front of the stabilizer. We suggest that you pin the empennage in place and locate the control horns and pushrod slots at this time. Make up the pushrods from 1/4" square hard balsa and trial fit in the fuselage. When you are satisfied with the pushrod installation remove the empennage and pushrods. Cut the crossgrain aft bottom from 1/16" x 3" wide sheet and glue in place.

10) Trim turtledeck sheet flush with firewall and epoxy cowl sides in place. Install ¼" sheet cowl bottom and trim front flush with sides. Next install the ¼" sheet noseblock, aligning carefully. Re-install the engine and engine mount, and carve the cowl to clear the engine, cutting any openings for the needle valve and muffler at this time. Remove engine and contour the outside of the cowl as shown on the plans.

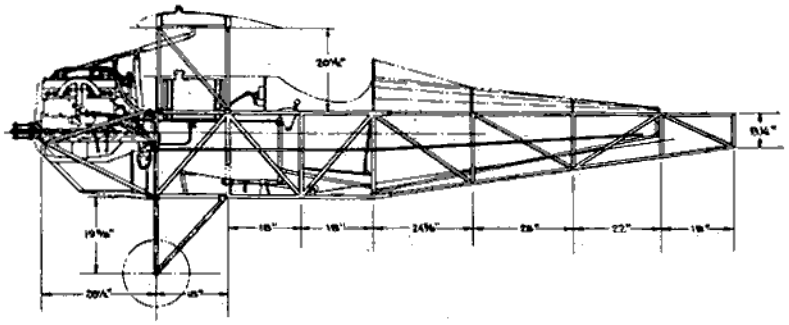
11) Drill two 3/16" diameter holes in both sides for the bottom wing hold-downs. Drill 1/8" diameter holes through the cabane/wing support joints as shown on the plan. These are for the two 1/8" dowel cross ties, which are best installed after covering. Sand the fuselage all over, rounding the corners and blending the stringers and turtledeck smoothly. Cut out the cockpit opening using the pattern on the plans. Epoxy the tail skid in place and bend a common pin to form a U-shaped staple for extra support.

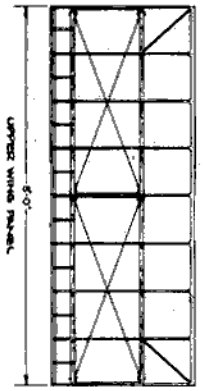
Covering and Finishing:

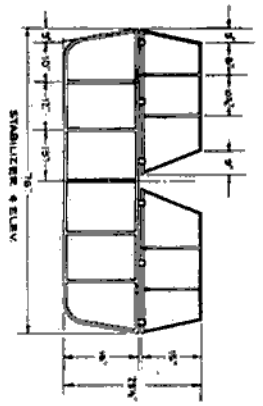
We suggest that you cover your Gere Sport with Super MonoKote or Solarfilm, this will provide a good looking model with a minimum weight increase. Before covering, coat the inside of the cowl, firewall, cabanes, and wing supports, and landing gear plates with clear Hobbypoxy or other fuel proof paint. We used flat black Hobbypoxy for the cowl and cockpit interior, and gloss black on the cabane structure and landing gear plates. We covered the prototypes with Solarfilm, using silver on the wings and horizontal tail, and black for the fuselage and vertical tail.

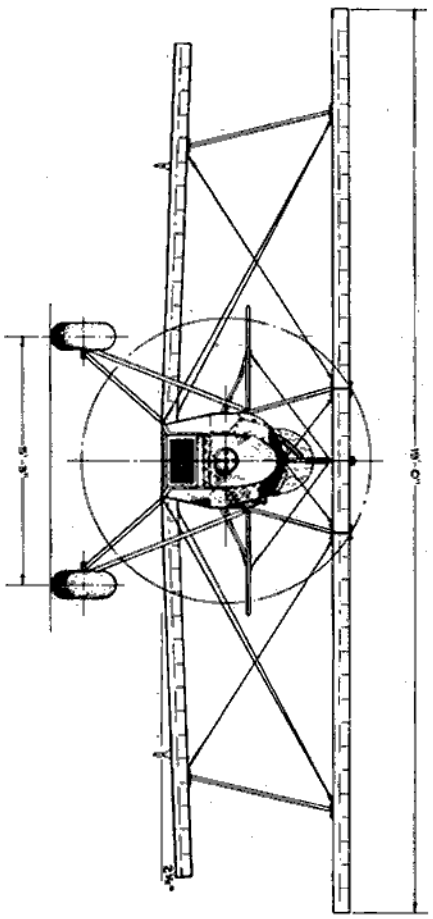
The only difficult area to cover is the fuselage turtledeck from F-5 forward. We suggest that you cut a piece of covering material 6" x 13" and tack it down first at the center seam. Work down around the curve, toward the sides, using low heat. Slit the film to clear the cabane uprights, then continue ironing down until the whole turtledeck is covered. Trim off the surplus material and cover the rest of the fuselage. Cover the headrest separately and use Hot Stuff to secure it in place on the previously covered aft turtledeck.

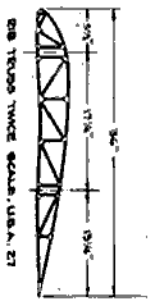
Cut the windshield to the proper outline and use Hot Stuff to secure it to the finished fuselage, then apply a piece of DJ's or Bridi Striping Tape on the seam to further secure the windshield. Now you can add trim, registration numbers, etc., to dress up the ship to your taste. Remember that this was a

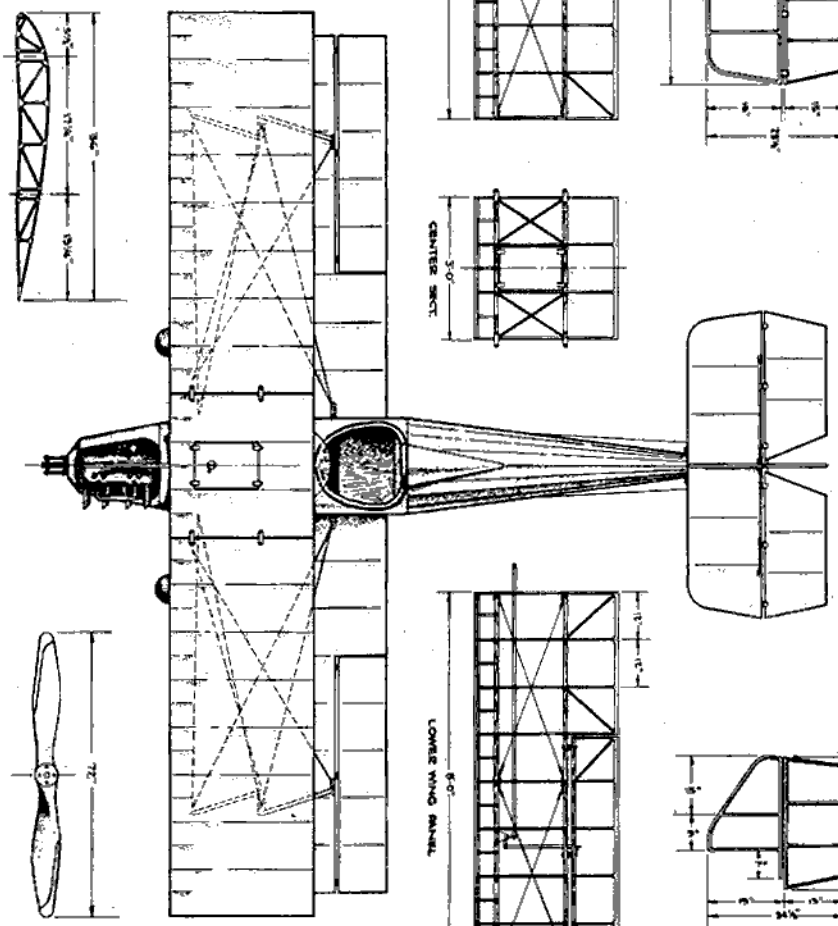


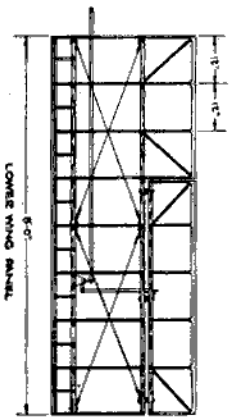


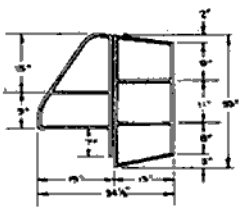


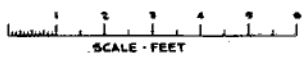


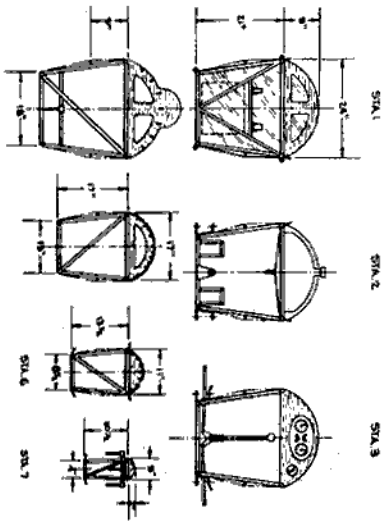


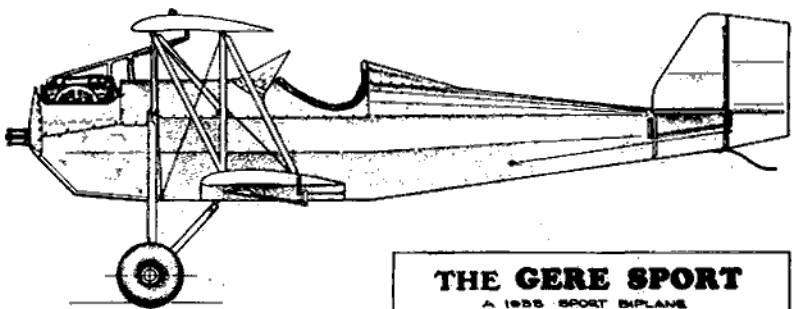












AERODYNAMIC DATA	
DIHEDRAL - LWR WING ONLY	2½°
INCIDENCE - LWR WING ONLY	1½°
STAGGER	17½"
AIRFOIL -	U.S.A. 27
C.G. LOCATION	L.E. LOWER WING

THE GERE SPORT

A 1935 SPORT BIPLANE

WING SPAN	19 FT.
LENGTH	16 FT.
WING AREA	111 SQ FT.
EMPTY WEIGHT	609 LBS.
GROSS WEIGHT	875 LBS.
WING LOADING - GROSS PER SQ.FT.	7.88 LBS.
CRUISE SPEED CHEV. 4 19 H.P.	50 M.P.H.
CRUISE SPEED FORD 'A' 40 H.P.	80 M.P.H.

. . . . . homebuilt aircraft during the Great Depression and should be kept simple.

Final Assembly:

Glue the stabilizer in place, removing any covering from the contact surfaces. Next, glue the fin in place, aligning carefully along the fuselage centerline. Now install the hinges in both surfaces, mount the control horns, and install the pushrods. Mount the landing gear and retainer plate, then add the wheels, using wheel collars to secure them to the wire gear. Install the engine mount, then the engine, using a washer under the rear lug holes to provide downthrust. Install the fuel tank and lines and you are ready for the radio installation.

Because of the short nose moment, try to keep the weight as far forward as possible. Wrap the battery in foam and push up against the firewall. If you are using small servos, these can be mounted three abreast or in 2+1 configuration. If necessary, to help balance the model, mount the receiver behind the servos. Be sure that the model balances as shown on the plans, even if you have to add weight to the nose. With the C.G. aft of the point shown, this ship is a real handful! When satisfied with your radio placement, install the servo rails, then mount the servos and hook up the pushrods. Check for proper control action and set all surfaces for minimum throw for the first flights.

Flying:

We recommend that you hand launch the Gere Sport for the first trim flights. With the minimum throws suggested, you should have no trouble achieving smooth responses. Check the power flight closely to check the thrust offsets. Note any climbing or turning tendencies so that you can correct by changing the offsets. When you are satisfied that you know the characteristics of your Gere Sport, increase the throws to suit your flying style and go wring it out.

The sky's the limit! □

From RCModeler Mar. 1976