

FAMOUS HOME BUILTS OF THE PAST

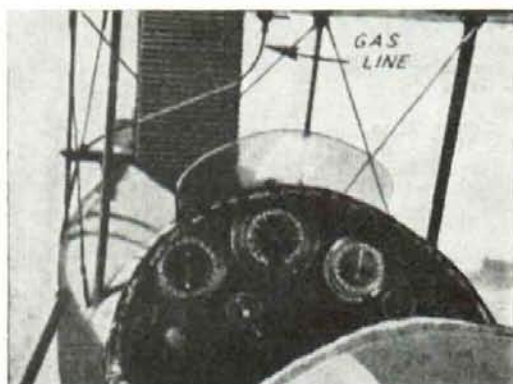
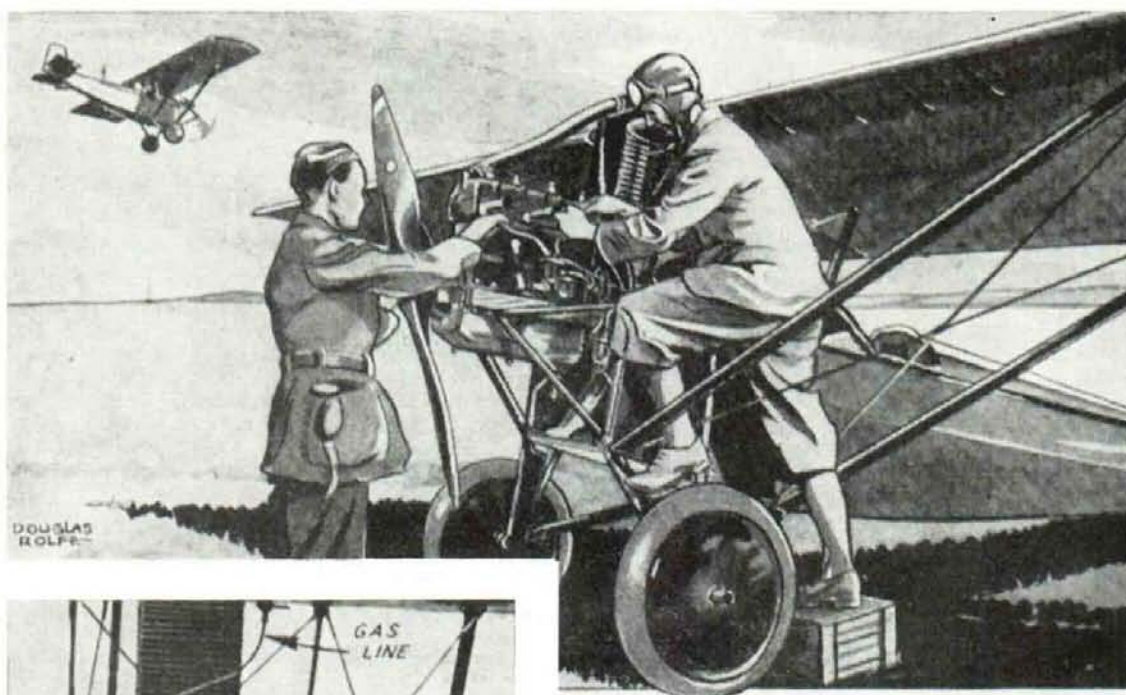


Here's the "Sky Scout" taxiing out for a flight.

The Pietenpol "Sky Scout"

By George Hardie, Jr.

Everyone attending the 1957 EAA Fly-In had an opportunity to look over three fine examples of the famous Pietenpol "Air Camper" design, and to observe the flying characteristics of this rugged pioneer among homebuilts. One of the ships, owned and flown by



Doug Rolfe's drawing gives an idea of the "Sky Scout's" proportions. The photo at left indicates that the radiator interfered with forward visibility to some extent.

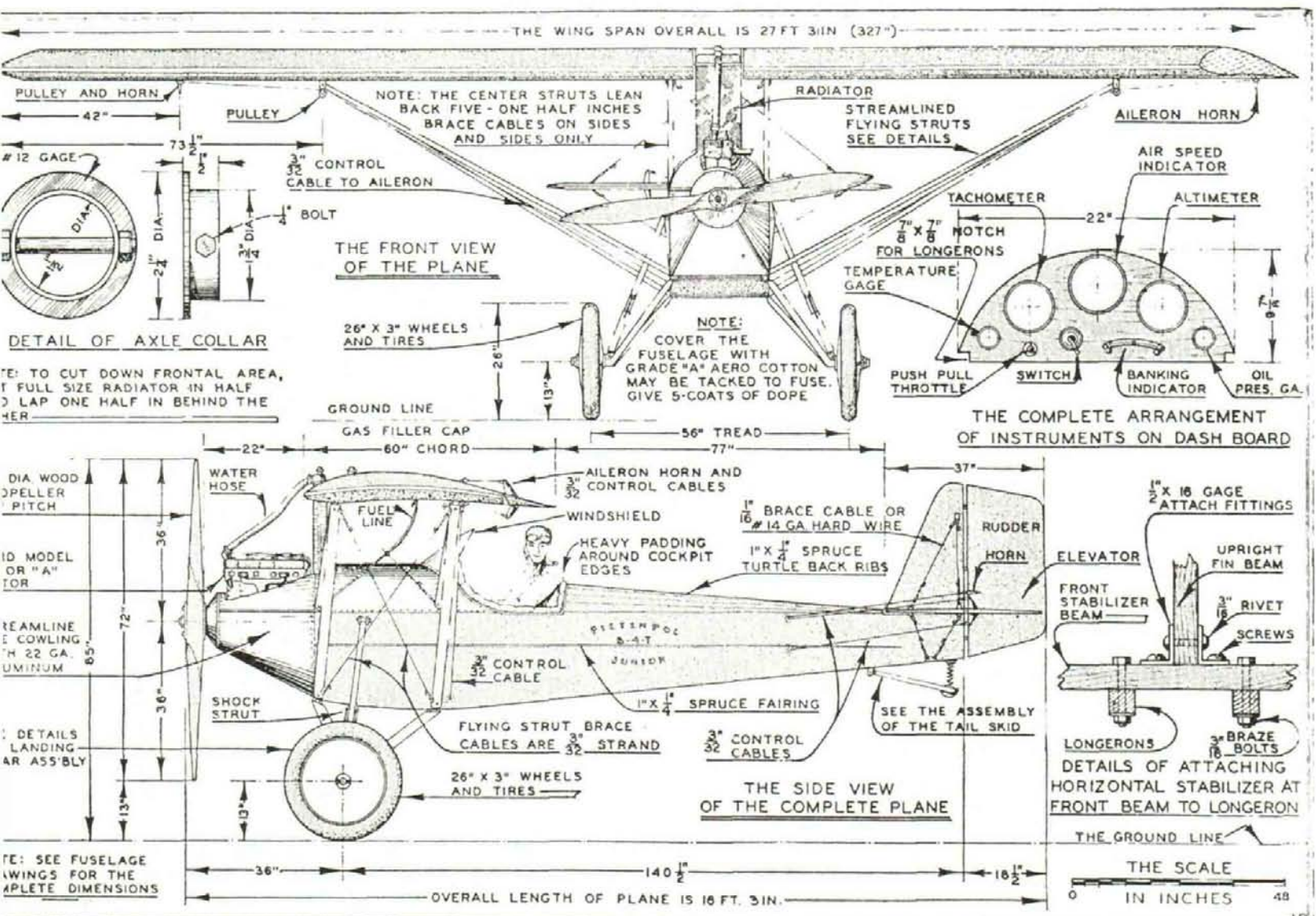
PIETENPOL AIR CAMPER
FORD MODEL "A" MOTOR

PIETENPOL ONE SEATER
FORD MODEL "T" MOTOR

Not generally known is the fact that the designer of the "Air Camper", B. H. Pietenpol of Spring Valley, Minn., also designed a single-seater expressly to be powered with a modified Model T Ford engine. This was the "Sky Scout" details of which appeared in the 1933 Flying Manual from which we reproduce some of the draw-

Our purpose in presenting this series on these old aircraft is to acquaint our readers with the construction details and the simple, practical approach made by the pioneer designers. The basic problem of yesterday's homebuilder (and today's as well) was to get

The "Sky Scout", like Wilbur Smith's "Termite" featured in the January issue of SPORT AVIATION, was of all-wood construction, and was very similar in design to the earlier "Air Camper" as indicated in the silhouette comparison. It was designed around the plentiful Model T Ford engine (converted for aircraft use) but with a few minor changes in the design, the Model A engine could



also be used. Pietenpol claimed the "Sky Scout" to be the easiest ship to build and fly as was possible to make it. The accompanying outline drawings would seem to bear him out.

Construction was started with the fuselage. Quoting from Pietenpol's article in the 1933 Flying Manual:

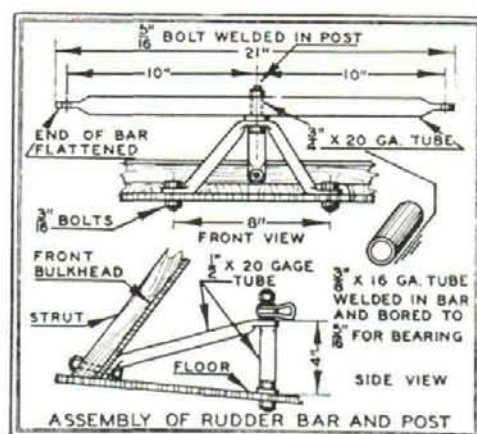
"The construction of the fuselage is very plainly drawn up and I don't think you will have any trouble with it. It is made from $\frac{7}{8}$ in. x $\frac{7}{8}$ in. spruce, for longerons and struts, while the sides and front are covered with $\frac{3}{32}$ in. mahogany plywood. The floor is made of $\frac{1}{4}$ in. five-ply Haskellite. All gusset plates of $\frac{1}{8}$ in. material. Remember, all plywood must be

regular aircraft grade and waterproof.

"Use a good glue. We use Rodgers semi-waterproof and give it two good coats of varnish. You may use regular casein glue, but be sure you know how to handle it. It won't keep long (12 hours).

"You will need a large bench on which to draw out and build your fuselage jig. We use the same jig for both sides.

"Each strut is held in place by blocks which are left nailed down until both sides are finished. Also leave the longerons a little long, and wrap some wire from the top to the bottom longerons, twisting it tight with a nail until you have the plywood nailed and glued on



each side. When the glue is dry, you may saw off the longerons in front.

"First lay out one side in the jig, putting in all struts and braces. When you make one strut, make another just like it to be used on the other side so the two will be exactly alike. Be sure to use a miter box for this work.

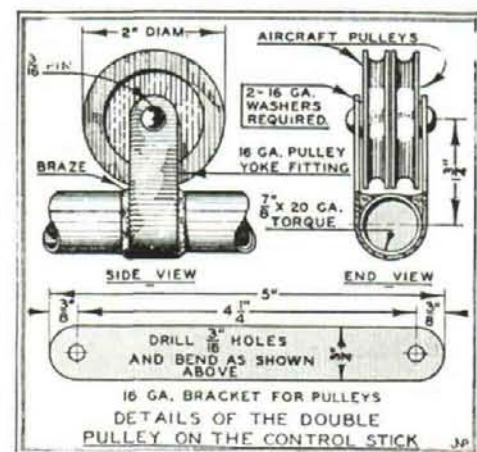
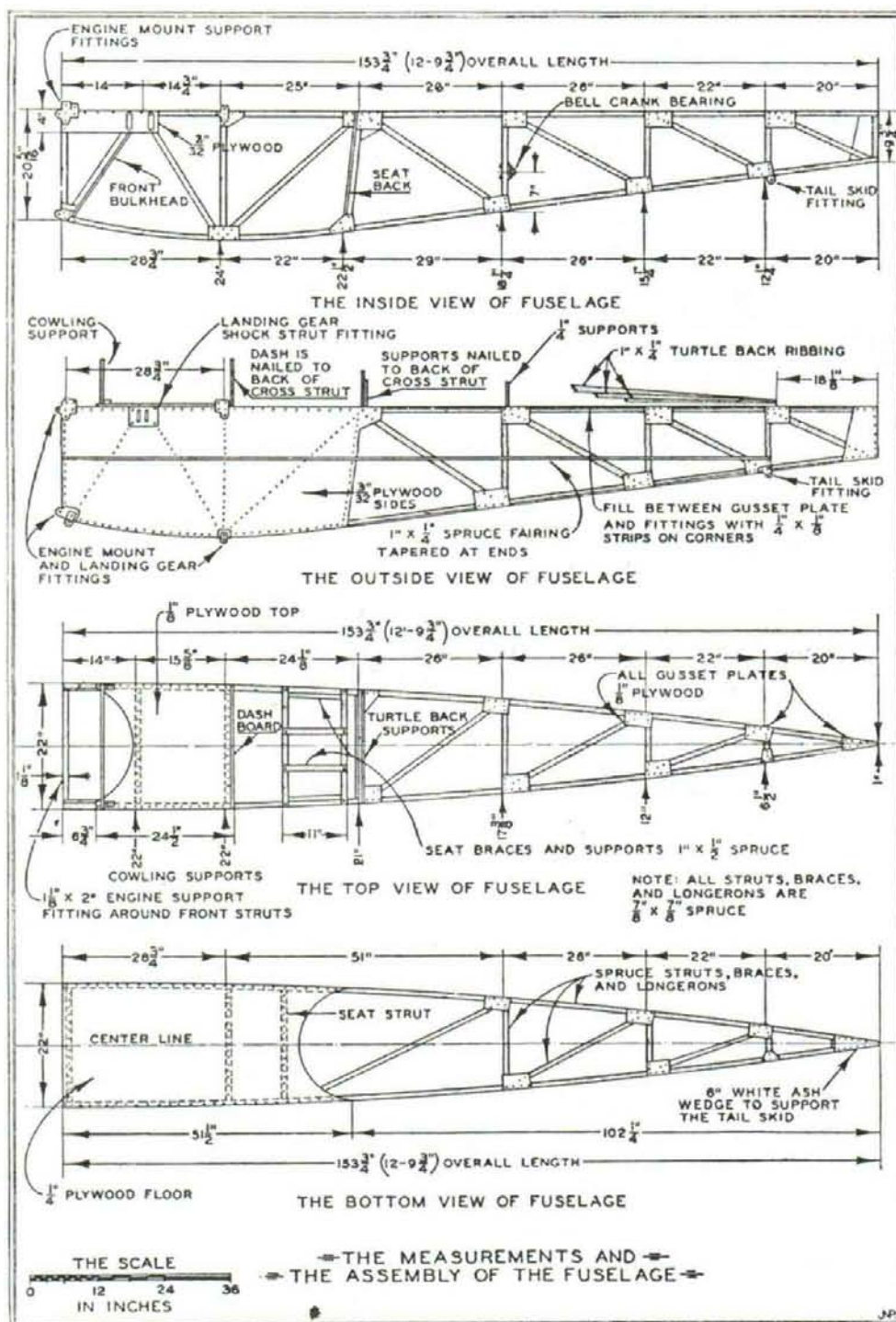
"Next glue and nail on all the $\frac{1}{8}$ in. gusset plates, wire the front longerons together so they will not spring apart and break the gusset plates.

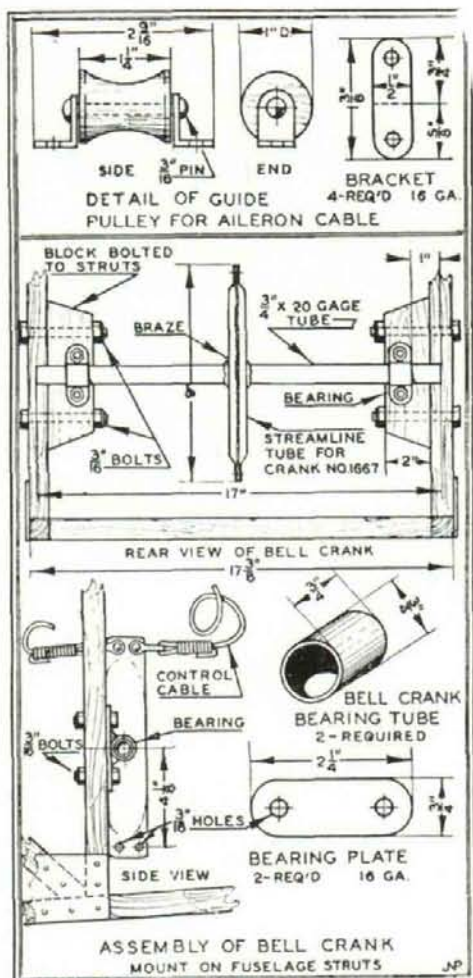
"Now remove the side from the jig, pat the longerons, struts and braces for the other side into the jig, and put in the gusset plates, starting from the tail and working up to where the $\frac{3}{32}$ in. sides start.

"Now take the side you have just finished from the jig, lay it on a piece of $\frac{3}{32}$ in. plywood, and mark out all longerons, struts and braces by running a pencil around them, then cut the plywood the size of the fuselage. Make two of these - one for the right and one for the left side.

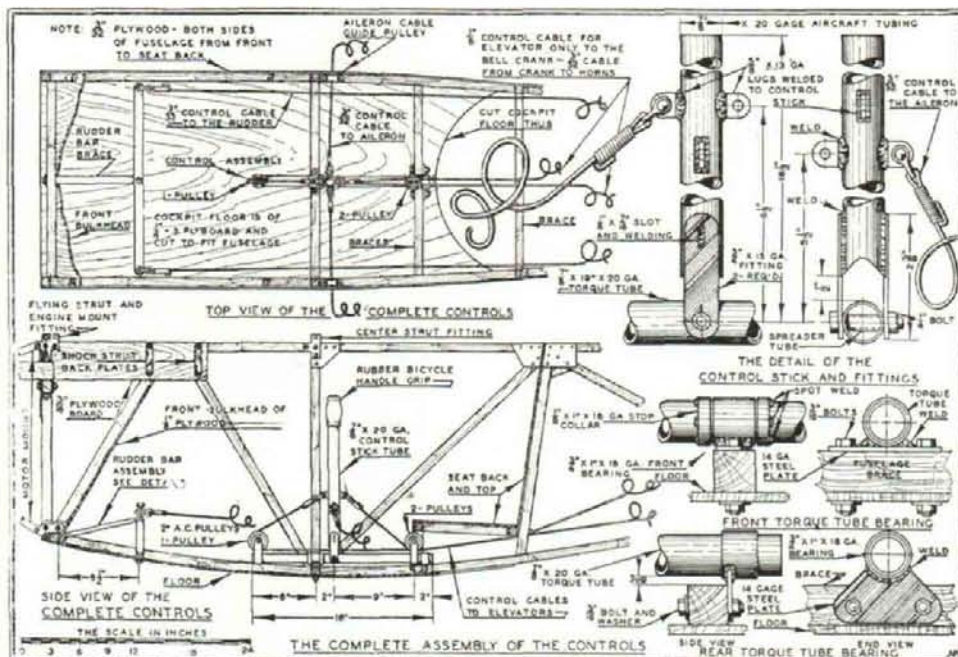
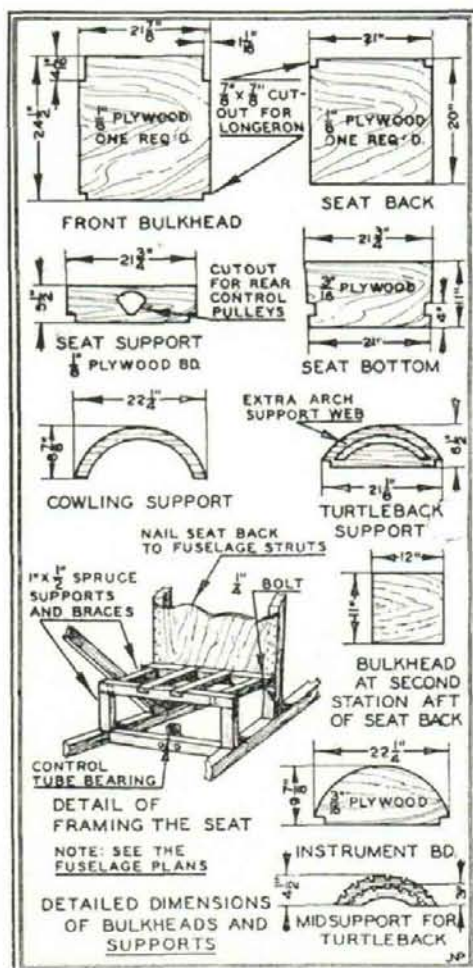
"The side of the plywood bearing the pencil marks goes on the outside, and gives you good marks to keep your nails between.

"Now put a good layer of glue on the longerons, struts and braces





as far back as the plywood goes; lay on your plywood and get busy nailing it down with 3/4 in. x 18 gauge cement coated nails. All



other gusset plates are also put on with this size nail.

"When you have this done, wire the front of the longerons together and remove from the jig. Now remove all the blocks from the bench so that it is smooth. Turn the side of the fuselage over and put the gusset plates on that side; then do the same with the first side you started.

"Now take the two sides and clamp them together. Saw off the ends of the longerons exactly the same length. Take a tri-square and mark off all strut stations, the place for the instrument board, and a few marks that will come in handy to measure from.

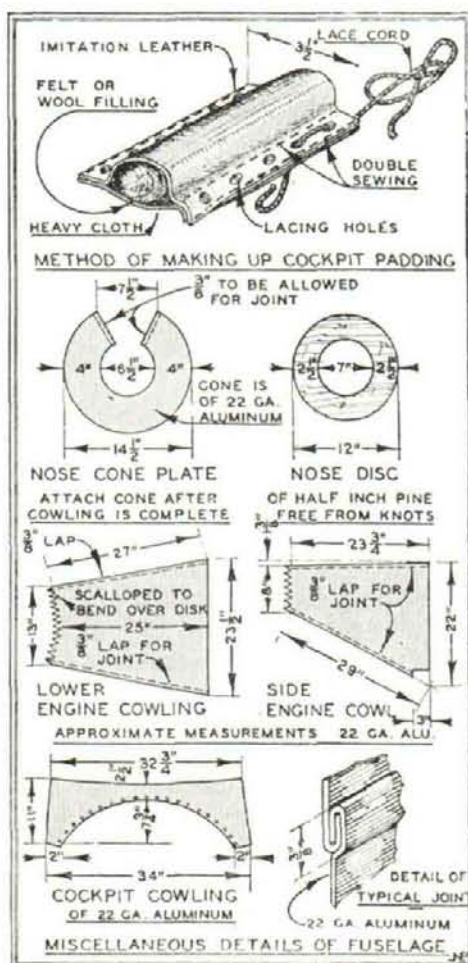
"Now make the seat back and the front bulkhead. (These must be perfect, as the whole job depends on them). Nail and glue them in place. You may now put in the 1/4 in. x five-plywood floor, nailing it in with 1 in. 17 gauge nails. Next comes the top of the fuselage.

"Now pull the tail end of the longerons together, make this joint fit good, glue and nail it good, and put in all the rest of the struts and braces, using the center line method to get it straight. That is, make a line in the center of each strut and make a tight string or wire pass over this line when drawn from the center of front to center of the tail post.

"The struts are next set on the gusset plates of the sides. Then put on the turtle back, instrument board, cowling, and support and the woodwork is finished except

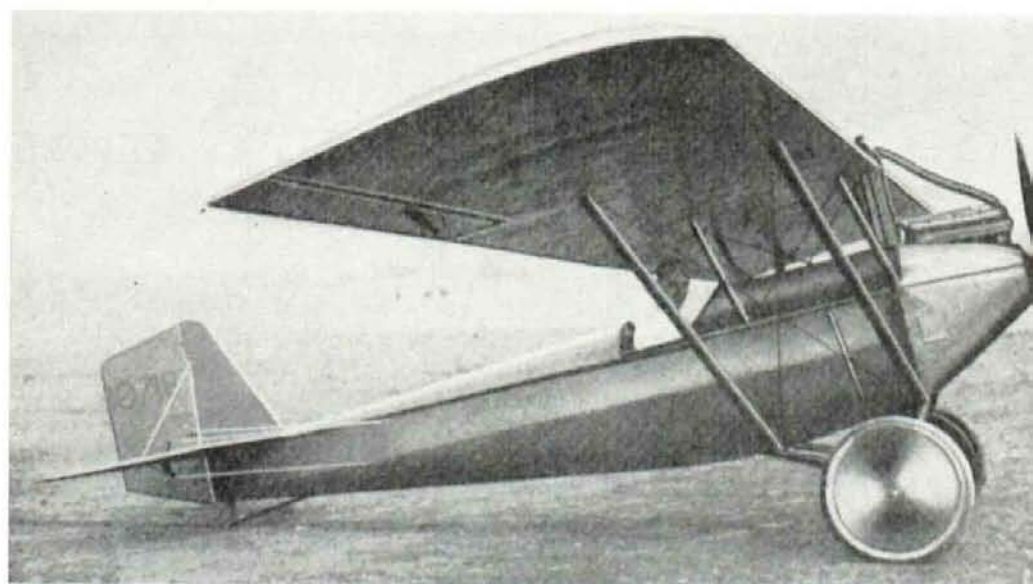
for the seat, which you should have no trouble with."

Drawings of the control system are self-explanatory. While primitive by today's standards, they served the purpose. Many construction techniques used would not be acceptable today. However, the "Sky Scout" remains a practical design, basically simple and straight forward. Next month's Part 2 in the series will give details on the wings and tail surfaces.



The Pietenpol "Sky Scout"

By George Hardie, Jr.



Part 1 of this series on the Model T-powered Pietenpol "Sky Scout" dealt with the construction of the fuselage and presented detailed drawings on it and the controls system and cockpit. This month we will continue with details on the construction of the wing and empennage.

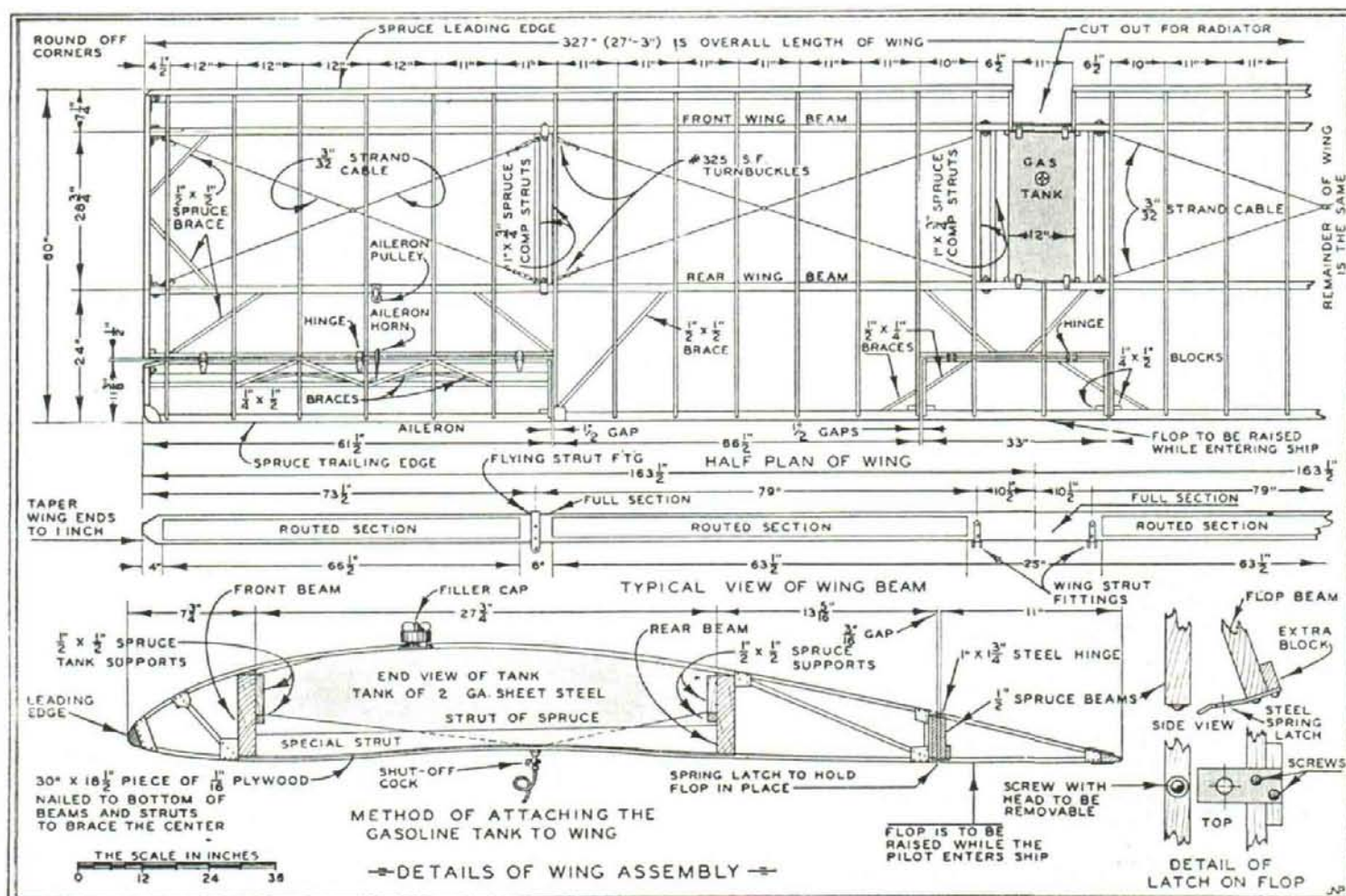
The wing used on the "Sky Scout" was practically the same as that of the "Air Camper" except that it was 11 in. shorter in span. Rib construction and airfoil were exactly the same on both ships. An

interesting account on how Pietenpol evolved his airfoil section after much experimentation was included in the article on the "Air Camper" that appeared in the May, 1956 issue of the *EXPERIMENTER*. Similarity of other design features is evident upon a close comparison of the two ships.

Quoting again from Pietenpol's article in the 1933 Flying Manual, on the wing construction of the "Sky Scout" (reprinted through the kind permission of *Mechanix Illustrated* magazine):

"The wing on the 'Sky Scout' is much too strong and could be lightened a little. It weighs about 90 lbs. complete. It was only built this heavy because all the regular parts to build the 'Air Camper' wing were used.

HOME



the big wheels and the radiator blocking the visibility makes the "Sky Scout" look ancient, but at least it flew!

"I wish to call your attention to the brace right back of the rear beam. This was changed from the plans of the 'Air Camper', and I advise all of you who have not built up your wings to build them this way.

"After your ribs are finished, make your beams and splice them in the center. Now mark off all places where the ribs will come, having the two beams clamped together. A good way to do this is to mark off the places on half of the spars, then reverse one beam and mark the other half from the first marks. You will then know that it is right.

"Next glue in the piece of 3/32 in. or 1/8 in. plywood that is set beneath the gas tank, and be sure

you have this in the center and perfectly square, as the whole wing is lined up from this center. Now put on all the ribs and glue and nail them with two 1 in. by 17 gauge nails at each joint. On the top it will be found necessary to put in small spruce blocks to fill up the gap. These must be glued on both sides.

"The fittings are so clear on the plans that it would be a waste of time to say anything about them. They are all made of regular 1025 aircraft steel and are more than strong enough.

"Next put on all wing fittings and brace wires (we use 3/32 in. cable as it is easier to handle, although No. 12 hard wire is OK), and line the wing up with the wires. Do not make them too tight until you get in your compression struts and wing tips.

"Now put on the leading edge, trailing edge, aileron beams, flap beams, and wing tips in the order named. Line up the wing so that it is perfectly straight and put in all the braces. Put in the 1/4 in. x 1/4 in. braces on the ailerons and put all filler strips on the aileron hinges (which are only small strap hinges with a new pin put in which

has a cotter pin hole in its end).

"Now place the control horns, and you are ready to cut the ailerons and center flap from the wing. By leaving all the ribs full length and cutting the ailerons and flap free, when finished you are sure to get a better and straighter wing. After you have all the parts finished and sanded, you may give the whole thing a coat of varnish.

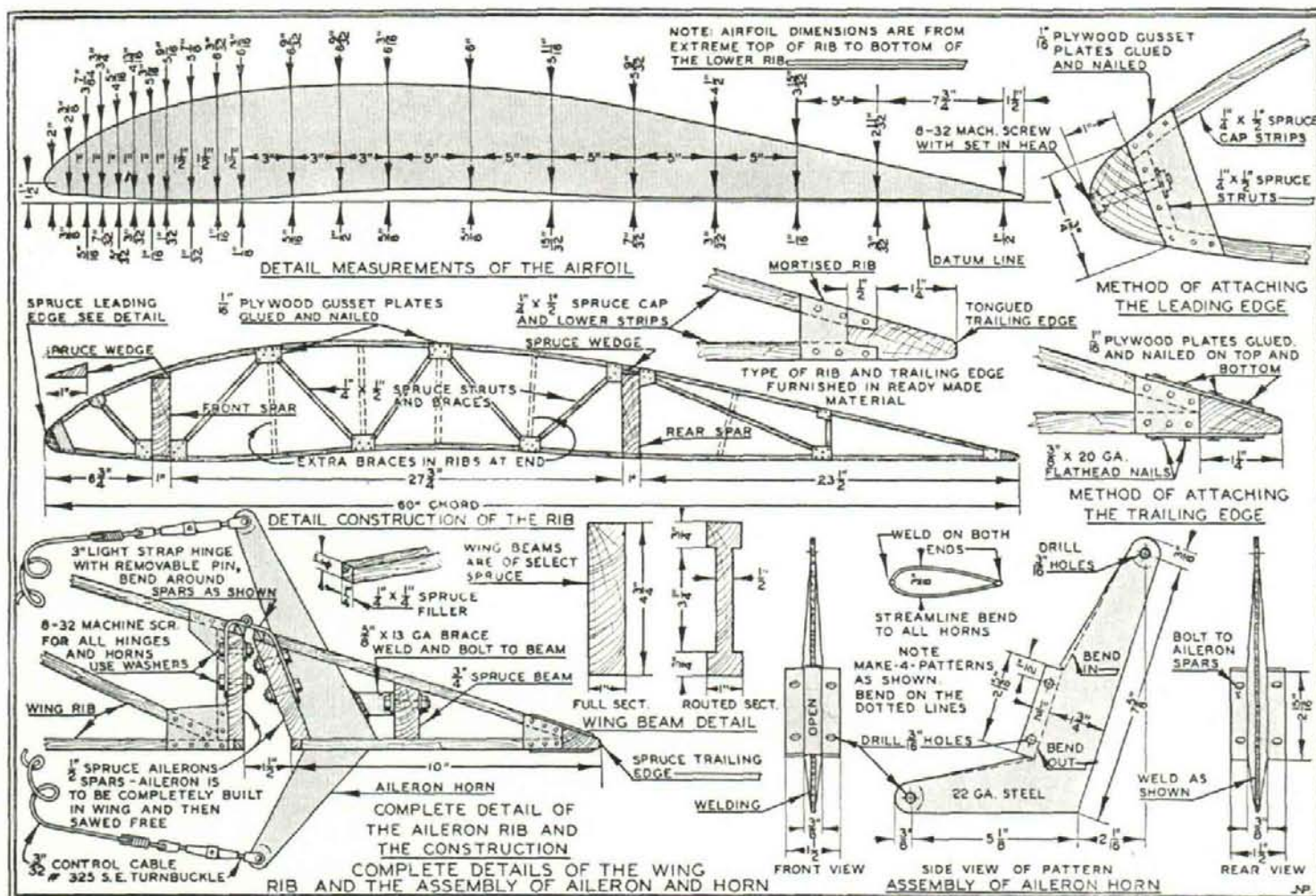
"Put in the gas tank (5 1/2 gallon) and the wing is ready to cover. You may use any light grade of aircraft cloth for this or you may use sheeting. Tack a piece 60 in wide the full length of the wing all around the edge, bottom side first. Give the edge a coat of dope, turn the wing over and do the same on top.

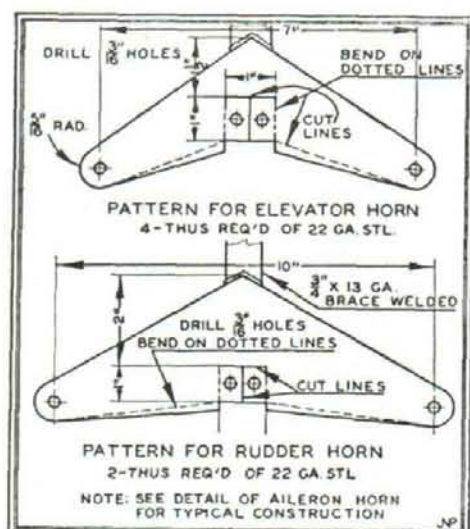
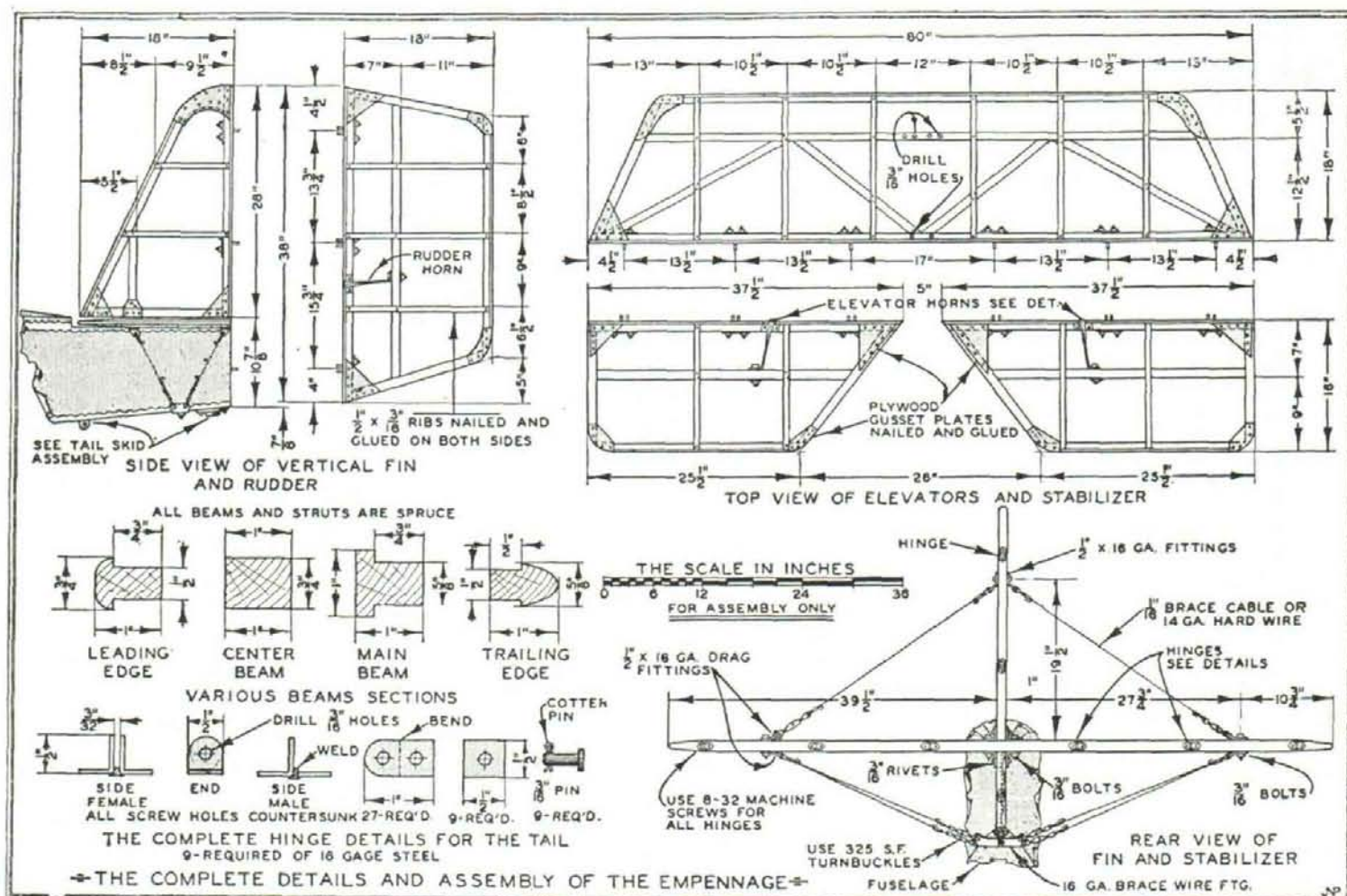
"Now sew the cloth to the ribs in the regular manner, put on a coat of dope, then all the tape and patches around the fittings and give the wing four extra coats of dope (five in all). The last two coats may be colored. I advise a light coat of paint on the wing if you wish the cloth to last a long time, although this makes the ship harder to patch.

"Just a little warning, be sure and put the flap in the center. A

BUILTS

AST





lot of those building the 'Air Camper' did not do this but put a large opening instead and spoiled the climb of the ship. Remember that you cannot have all the features of a high powered plane in a small Ford-powered ship and expect it to fly well, and the flop is one of the things that makes these ships a success. The first thing to remember in building a low-powered ship is to keep the weight down and the efficiency up."

The sage advice expressed in that last sentence holds as true today as the day it was written. While some of the techniques recommended in the above quotation

would be questioned by today's standards, still one must admire the practical approach made to the problem of designing a simply constructed, economical aircraft. Again I wish to emphasize that these drawings and details on these old aircraft are presented for study and evaluation, rather than as a recommended project for the homebuilder. Materials used would be in some cases unacceptable today, but the fact that even with these handicaps these old aircraft proved successful speaks well for the courage of these pioneer homebuilders. Today we can draw upon their experiences as a valuable

guide and with the vastly superior advantage of being able to choose our materials from a wide selection of proven types and grades, we should be able to produce superior designs.

The tail surfaces of the "Sky Scout" follow the same general lines as those of the "Air Camper". Wood construction was used, with covering of fabric. The drawings clearly show all details and are self-explanatory.

Next month's concluding article will present details on the landing gear, tail skid, motor mount, and struts and fittings.

Here's the "flop" mentioned by Pietenpol which increased the lift of the wing.





The "Sky Scout" gets off the ground quickly, and has a landing run of only 250 ft. Close-up below shows the Ford Model T engine installation on the Pietenpol "Sky Scout".

The Pietenpol "Sky Scout"

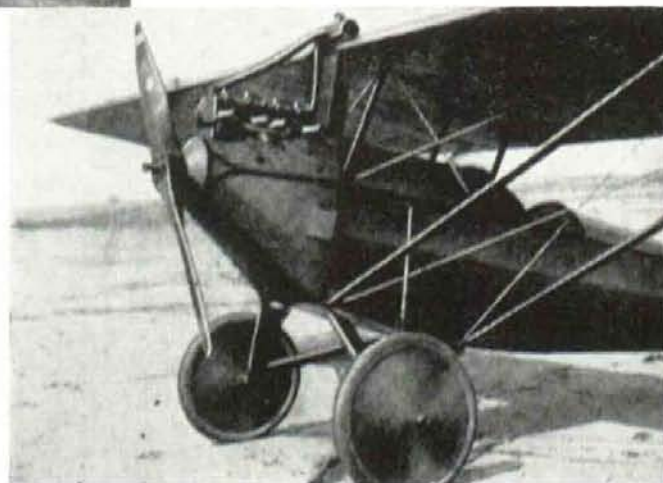
By George Hardie, Jr.

Homebuilders of 25 years ago were as anxious to get into the air as any today. B. H. Pietenpol of Spring Valley, Minn., provided one practical answer to this demand with his two-seater "Air Camper", designed to be powered with a converted Ford Model A engine. When he was flooded with requests for a design to take the plentiful (at that time) Ford Model T engine, he came up with the "Sky Scout", a single-seater whose con-

Part 3 of 3 Parts

struction was practically the same as the "Air Camper".

In two previous installments we have presented detailed drawings and

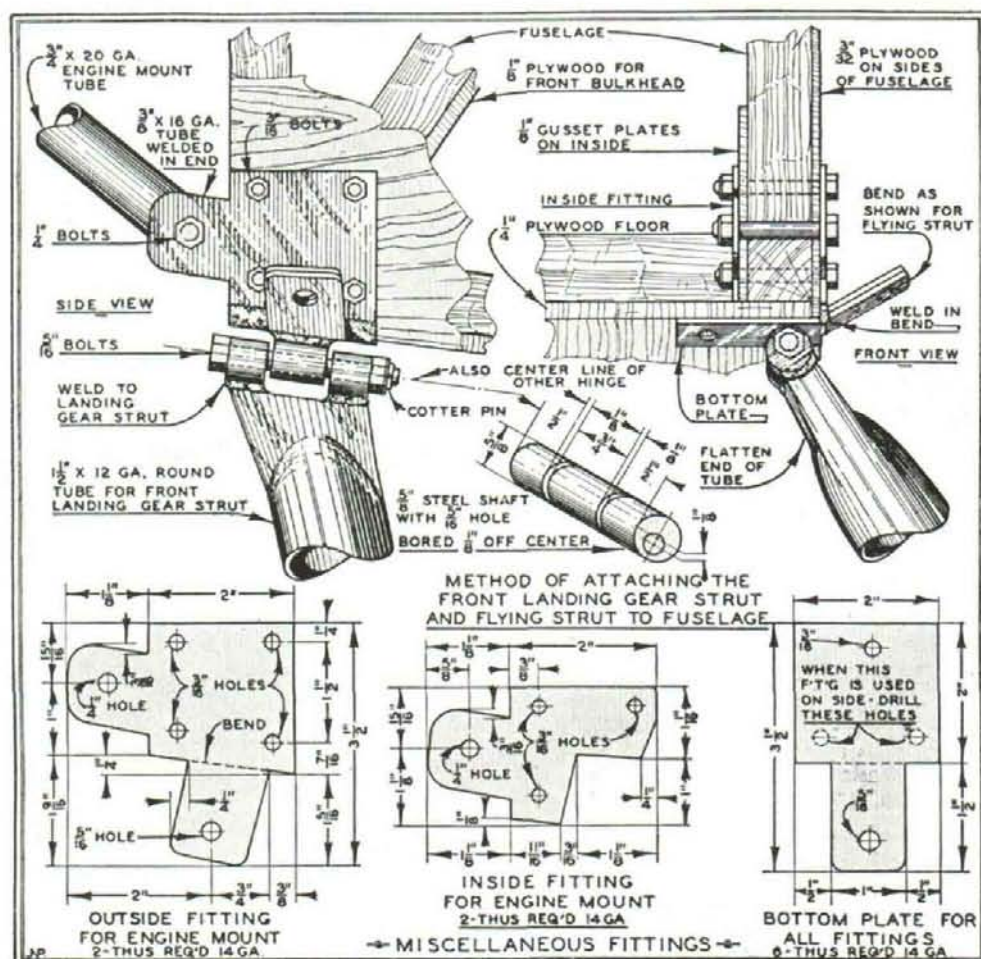


HOME

OF

data on the "Sky Scout", giving details and construction notes on the fuselage, wing and tail surfaces. In this final installment we present details on the landing gear, tail skid, motor mount, wing struts and fittings. This material is taken from the 1933 Flying Manual and is reprinted with the generous permission of *Mechanix Illustrated* magazine.

The landing gear on the "Sky Scout" followed the popular style of the day, using a Vee hinged to the lower longeron of the fuselage and a shock strut running up to a fit-



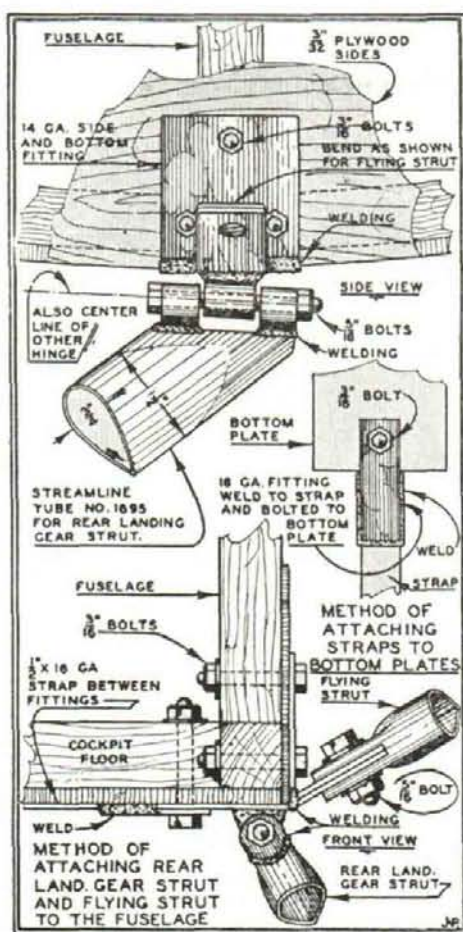
ting on the upper longeron. Pie-tenpol had this to say about it in the Flying Manual article:

"This has proven to be a very strong outfit which will stand plenty of abuse. While it would be difficult to explain how this is built, the plans are very clear and you should have no trouble.

"You will have to use a turning lathe and be a good welder to make the gear shown here. You may also build the type of landing gear that is used on the 'Air Camper'. You will find that this is much easier to make and is quite strong enough.

"While we are on the subject of the 'Air Camper' gear, we had better put on some safety device to keep the ship from dropping to the ground if the shock cord breaks, since it seems that everybody has trouble wrapping shock cord.

"Here is the method we use: First cut a piece of leather to fit around the bottom of the landing gear vee



up on the outside of the front landing gear strut. Take the other end and pass it under the landing gear vee, over the axle, under the vee on the inside of the first wrap, over the axle on the outside of the first wrap and under the vee on the inside of the last wrap until you have three wraps pulled quite tight.

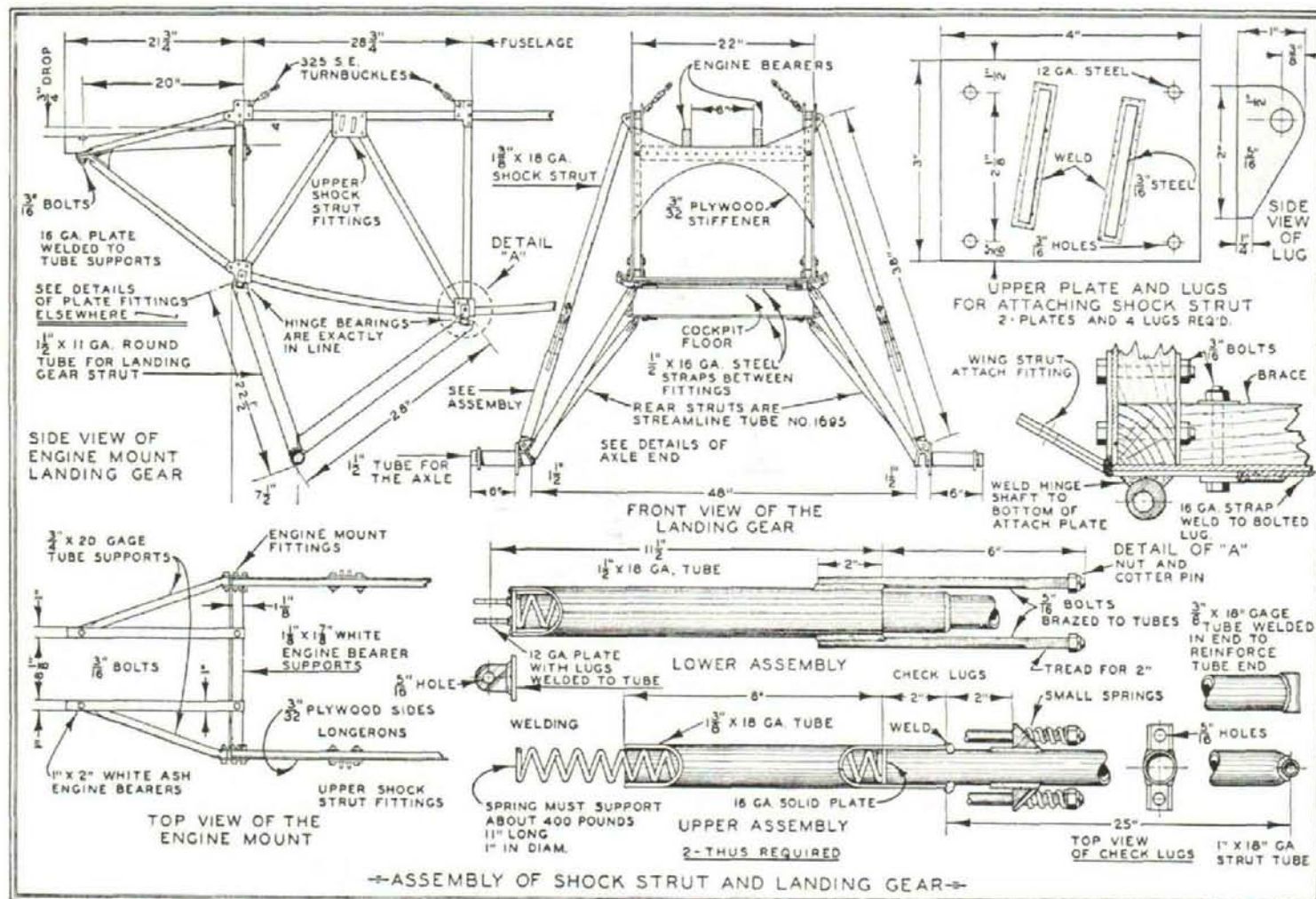
"The cord should be just long enough to make a good square knot and to permit taping of the ends. This method makes each wrap about the same length and you will not have any trouble with your shock cord cutting. The landing gear should give not over one inch with a full load in the ship, but neither should it be any tighter.

"The tail skid comes next. This is of extremely simple construction, but it has proved so efficient that we are now using it on all of the planes we build. Be sure to put a small keel on the shoe or you will find your ship hard to steer on a windy day. This keel will also help to prevent the beginner from ground looping."

and lace it on with lace leather. Now take 6 ft. of 1/2 in. shock cord and have someone hold it about half way

There aren't many airports left where tail skids are welcomed, so I suppose we may regard this item

BUILTS



ATTEND EAA's SIXTH NATIONAL FLY-IN AUGUST 8, 9, 10 MILWAUKEE, WIS.

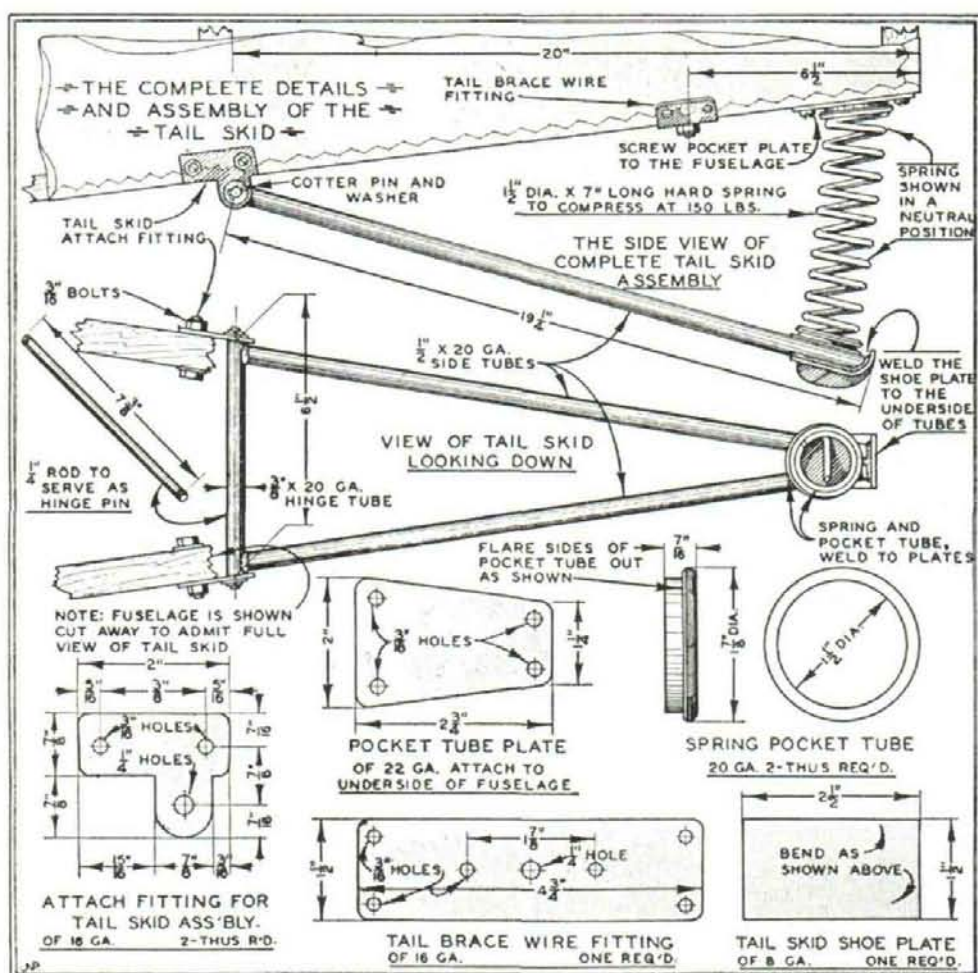
as a mark of the past. But let's continue with the construction notes:

"After you have your ship complete, that is, the motor in, tail group on, all controls in, and are ready for the wing, make up your center struts like the drawings, all brace wires made, then get about four extra helpers, put the wing on the center struts and line up.

"Next have someone hold up the ends of the wing so that it will have a little dihedral, and measure the length of the front flying struts. These should both be exactly the same length. When these are in place, do the same with the rear flying struts. Now make the flying or brace wires. Hook up the ailerons, safety all turnbuckles and your ship should be ready to go."

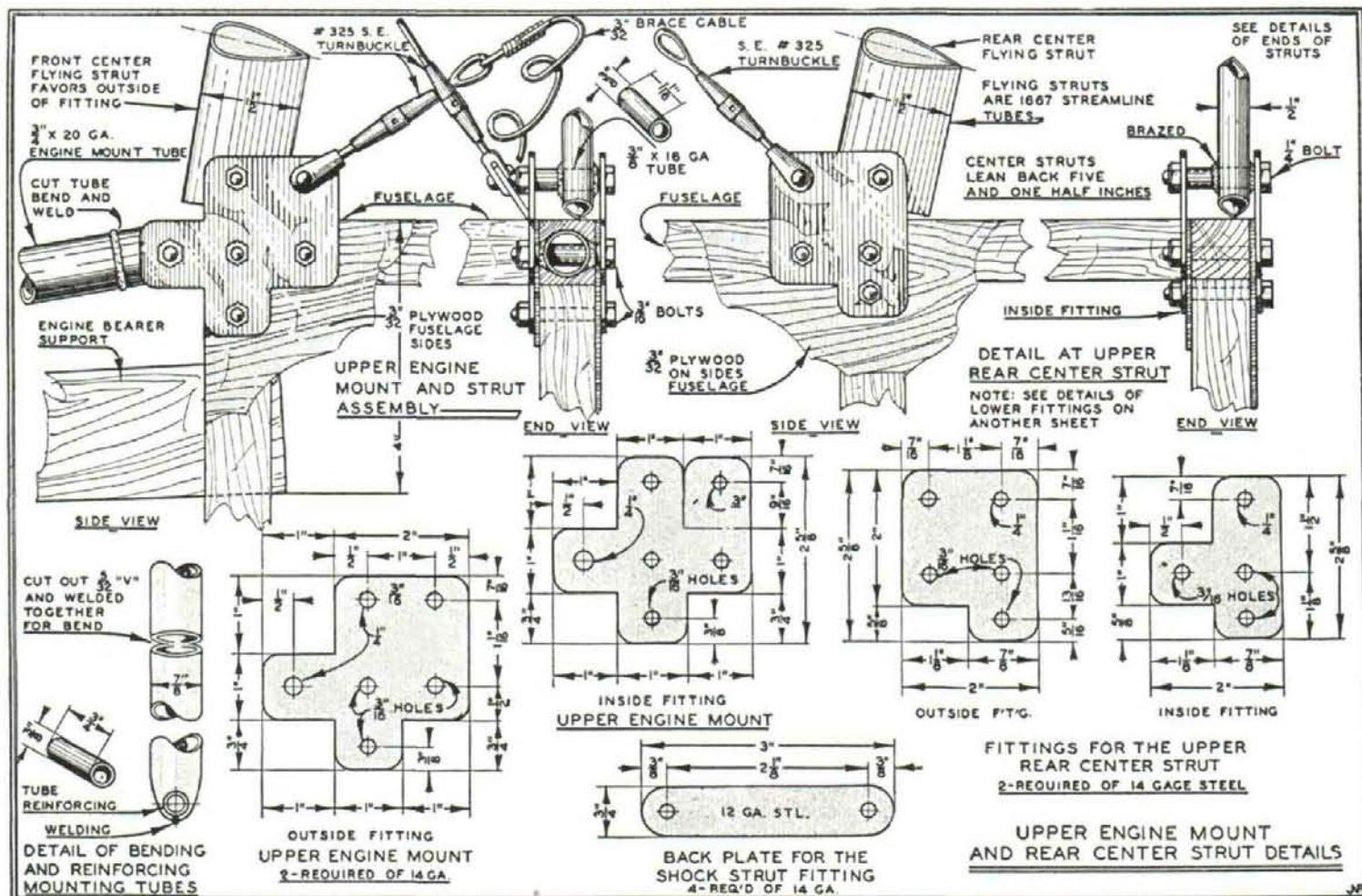
Simple enough for the ambitious mechanic. The completed airplane certainly would take no beauty prize, but the designer's practical approach to the problem of providing an economical machine of simple construction was evident in every line. Pietsenpol had this to say about his "Sky Scout":

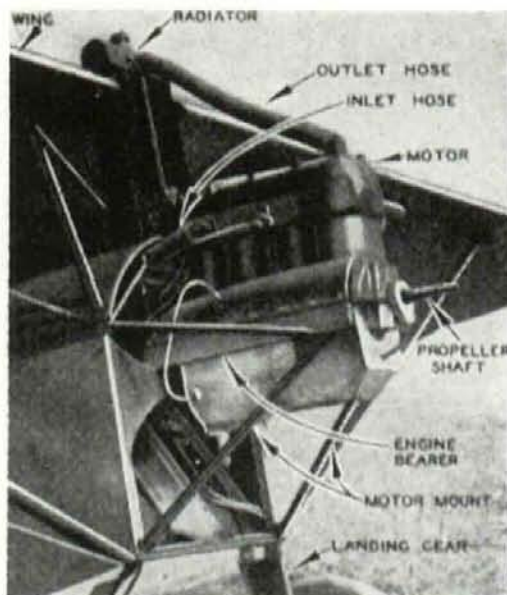
"I believe this to be the safest light plane there is, and if this design is a start in that direction, it has



all been well worth the time we have put into it. But those of you who wish only to build so that they will have something to fly had better

build it exactly as the plans, and you will be sure of having a ship that is very easy to handle. It is cheap to run and will land and take off at a





Here's the way the Model T was mounted on the "Sky Scout".

field where the average OX-5 job, or similar powered ship, would be completely out of luck."

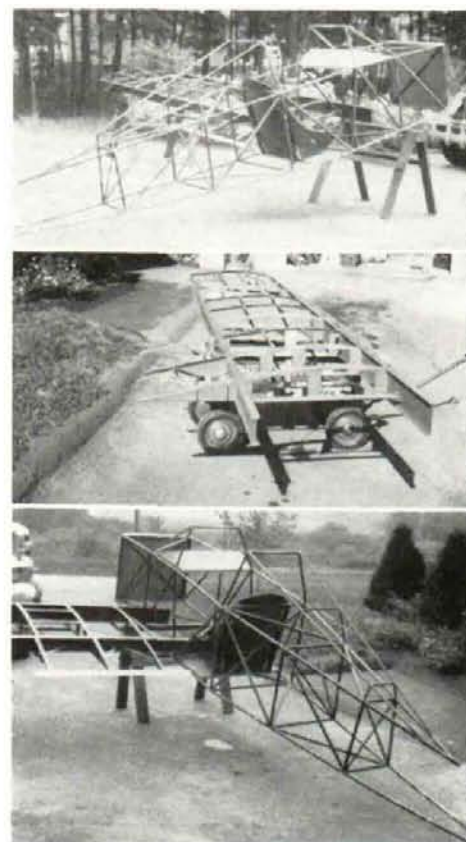
The hey-day of the "Sky Scout" has long since passed, but once again small all-wood aircraft are being built and flown. Wilbur Smith's "Termite", described in the January issue of SPORT AVIATION, is a fine example of what can be accomplished today. The Druine Turbulent and

Turbi, the Jodel "Bebe" and "Club" and many others indicate what can be done with wood construction. Several others, notably a single-place folding wing craft that we will present soon, show that designers are still seeking the simple, practical aircraft for just plain flying.

There is no way of knowing how many "Sky Scouts" were built, but there is no denying the fact that the design work of F. H. Pietenpol, as exemplified by his "Air Camper" and "Sky Scout" homebuilts, has left his mark on today's design thinking. Certainly the simplicity of construction and the practical approach to the design problems are goals that all homebuilts will always be seeking.

SPECIFICATIONS OF THE PIETENPOL "SKY SCOUT"

| | |
|----------------------|--------------|
| Top Speed | 62 mph |
| Cruising Speed | 55 mph |
| Landing Speed | 35 mph |
| Take-off Run | 150 ft. |
| Landing Run | 250 ft. |
| Initial Climb | 200 fpm |
| Span | 27 ft. 3 in. |
| Chord | 5 ft. |
| Length | 16 ft. 3 in. |

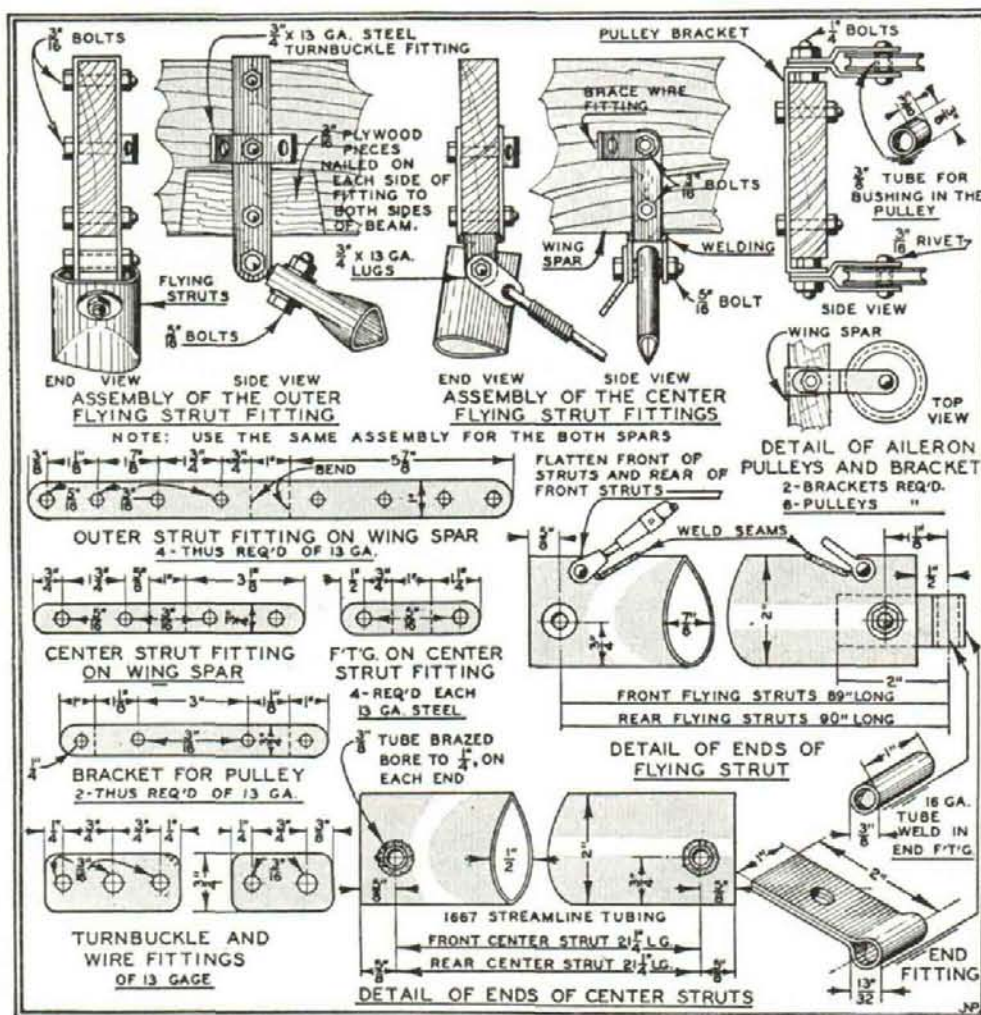


A FOLDING LOW-WING

John S. Zagorodny, 682 Matianuck Ave., Windsor, Conn., sends us photos of his low-wing monoplane. The wing is designed to fold inboard 6 ft. as on a shipboard fighter. Width with wings folded will be 8 ft., just right to fit in the door of John's garage. Wings are a redesign of Luscombe panels to take .020 - 75ST aluminum covering.

A Continental 75 is planned for power. Cessna type gear in the wing stubs will have wide tread. Weight empty is to be 480 lbs., with a 760 lbs. gross. Wing span is 20 ft. 6 in., area 80 sq. ft. Length is 17 ft. 6 in. John expects a cruising speed of 120 mph and a landing speed of 46.5 mph.

John writes, "I have but one regret - that I don't live in your area to be able to work with you fellows and get to your meetings, etc. It's very difficult pulling all alone to start a project and completely finish it, but I'll not give up. No matter how hard I try to get interest up around here, it lasts for only a few weeks. Perhaps when I get the ship flying and they see what I mean by a ship that's a mechanic's dream, maybe the bug will bite."



ATTEND EAA's SIXTH NATIONAL FLY-IN AUGUST 8, 9, 10 MILWAUKEE, WIS.