

P.Z.L. P-11c (The Pulawski P-11c)

A .40 size sport scale model of Poland's famous gull wing fighter of the 1930's.

By Thomas Haney

For lovers of gull winged aircraft, here is a .40 sized R/C model of the Polish P-11c that should whet your appetite to see the gull wing in flight.

The prototype of the P-11c, Zygmunt Pulawski's P-1, had for a brief period, carried Poland into the forefront of international fighter development. Many of the technical innovations of the P-1 were quickly copied by other aircraft companies around the world

in the thirties, only to provide an example of the speed with which the innovatively advanced could become obsolete in the few years before WWII.

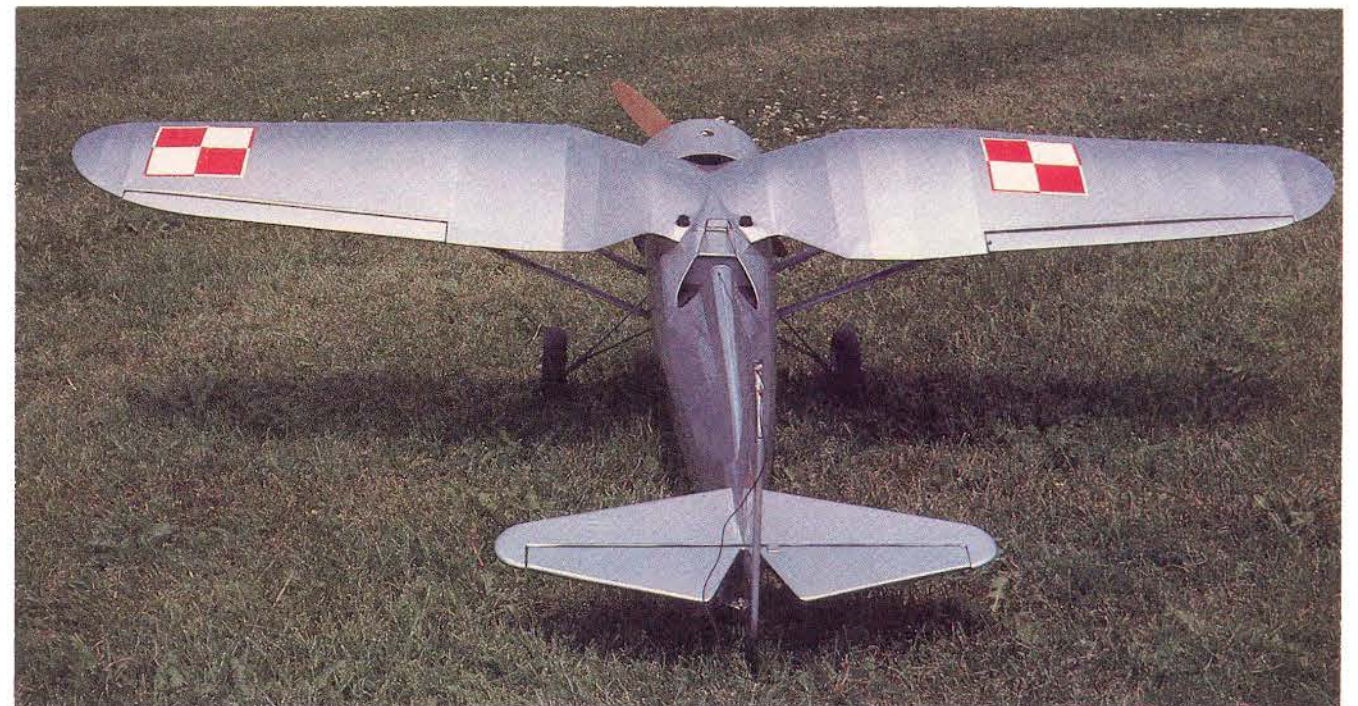
Flown for the first time on September 25, 1929, two of the P-1's most noteworthy features were its all metal construction and its unique gull wing. The wing design was later to become known as the "Polish" or "Pulawski" wing. The ultimate development of the Pulawski wing

fighter was the cannon-armed P-24. The P-24 was produced for export only going to Bulgaria, Greece, and Turkey. The P-24's sent to Turkey saw action until mid-1943.

The P-11c was the mainstay of the Polish Air Force when Hitler's forces invaded Poland on September 1, 1939. Although obsolete by comparison to the German aircraft, the excellent flight characteristics and durability of the P-11 enabled the Polish pilots to

destroy 14 German aircraft on the first day of battle.

My fascination with the P-11c started in 1967 when I purchased a Revell 1/72 plastic model of the P-11. When I got into R/C modeling in 1980, I had hopes of finding an R/C model of the P-11. These hopes faded fast as I got more involved in modern day R/C modeling. In 1985, I saw a picture of Harry Apoians' 1/4 scale, scale model of the P-11. Harry was gracious



enough to send me copies of 1/48 drawings of the full scale P-11.

After months of trying to obtain drawings from a number of different sources, I decided I would have to draw my own plans using the drawings from Harry. My purpose for creating an R/C model of the P-11 was not to produce an exact scale replica suitable for

P.Z.L. P-11c

Designed By:

Thomas C. Haney

TYPE AIRCRAFT

Sport Scale

WINGSPAN

53 Inches

WING CHORD

8 3/4 Inches (Avg.)

TOTAL WING AREA

400 Sq. In.

WING LOCATION

Gull Wing

AIRFOIL

Flat Bottom

WING PLANFORM

Double Tapered

DIHEDRAL EACH TIP

2 1/8 Inches

O.A. FUSELAGE LENGTH

35-3/16 Inches

RADIO COMPARTMENT SIZE

(L) 7 1/2" x (W) 3 1/8" x (H) 3 1/4"

STABILIZER SPAN

16 1/4 Inches

STABILIZER CHORD (incl. elev.)

4 1/2 Inches (Avg.)

STABILIZER AREA

64 1/2 Sq. In.

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Top of Fuselage

VERTICAL FIN HEIGHT

9 1/4 Inches

VERTICAL FIN WIDTH (incl. rud.)

8 Inches

REC. ENGINE SIZE

.35-.40 2-stroke

FUEL TANK SIZE

6 Oz.

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

4

CONTROL FUNCTIONS

Rud., Elev., Throt., Ail.

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa & Spruce
Empennage	Balsa
Wt. Ready To Fly	70-80 Oz. (4 1/2-5 Lbs.)
Wing Loading	25-28 Oz./Sq. Ft.

competition, but to have a semi-scale model that would be capable of good performance on a .40 engine and to satisfy my desire to see the gull wing in flight.

Here then are the results of my efforts.

CONSTRUCTION

Before going into some details of



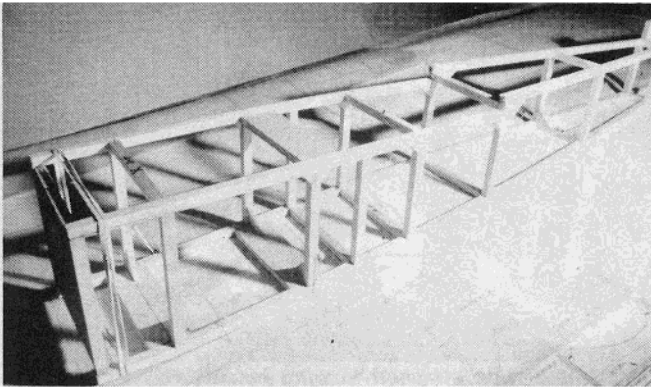
ABOUT THE AUTHOR

Tom Haney, 62, started his modeling career at the age of 10 with the old "square cut" balsa solid models (1937 era). After building a number of Comet rubber band models, he even tried a couple of his own design — and they flew! In 1980, after 8 1/2 years in the A.A.F./U.S.A.F., time at Indiana Tech to get a B.S. degree in mechanical engineering, and 25 years at the local natural gas utility company, he decided to try R/C modeling. He started out with an R/C boat but never finished it when he discovered a newly formed local R/C flying club.

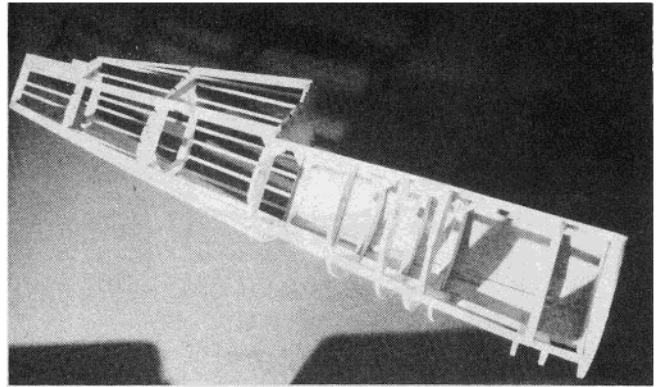
Now retired, Tom and his wife Mary live in Adrian, Michigan. In addition to his R/C flying and Mary's needlepoint, they both enjoy a good round of golf. Tom recently completed building an electric powered glider that Mary wants to learn to fly. Tom is a member of the Bits & Pieces R/C Club of Adrian.

Material Parts List

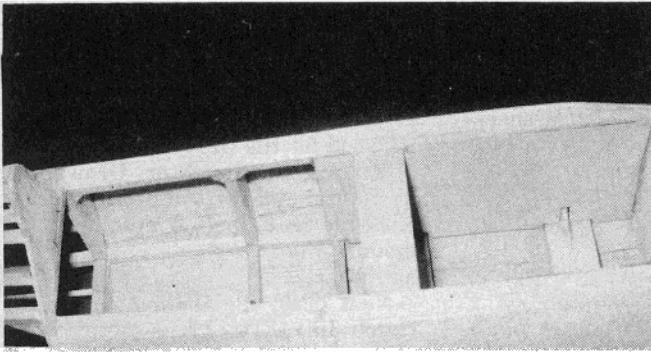
- 1 — 1/16" x 6" x 12" plywood (wing spar reinforcement)
- 3 — 1/16" x 3" x 36" balsa (fuselage and hatch sheeting and misc.)
- 1 — 1/8" x 3" x 36" balsa (fuselage formers)
- 10 — 1/8" x 3/16" x 36" med. hard balsa (fuselage stringers)
- 2 — 1/8" x 3/8" x 36" spruce (wing spar)
- 1 — 1/8" x 6" x 24" lite plywood (hatch bases, formers, bellcrank bases, and misc.)
- 2 — 1/8" x 1/4" x 36" balsa (tail assemblies)
- 2 — 3/32" x 3" x 36" med. hard balsa (wing ribs)
- 1 — 3/16" x 2" x 36" balsa (wing tips, misc. gussets)
- 1 — 3/16" x 3/8" x 36" med. hard balsa (wings)
- 2 — 1/4" x 3/4" x 36" med. hard balsa (wing spar)
- 1 — 1/4" x 1" x 36" balsa trailing edge (wings)
- 12 — 1/4" x 1/4" x 36" balsa (fuselage, tail assemblies)
- 1 — 1/4" x 1" x 36" balsa (fuselage, tail assemblies)
- 1 — 1/4" x 6" x 24" lite plywood (firewall, landing gear supports)
- 1 — 5/16" x 1 1/4" x 36" balsa trailing edge (wings)
- 2 — 3/8" x 3/4" x 36" med. hard balsa (wing leading edge), or use equiv. sized flat bottom airfoil leading edge material and trim to correct cross section pattern.
- 1 — 1/2" x 1/2" x 6" hard balsa (wing strut anchors)
- 1 — 5/32" dia. x 36" music wire (landing gear)
- 1 — pack 5/32" wheel collars
- 1 — 3/16" x 4" hardwood dowel (elevator)
- 1 — 1/4" x 3" hardwood dowel (wing)
- 1 — long motor mount, Dave Brown #4045L or equiv.
- 2 — aileron bellcrank, Du-Bro #167
- 4 — #4-40 x 1/4" bolt & blind nut, Du-Bro #127 (for mount to firewall)
- 4 — #4-40 x 3/4" socket head screws, Goldberg #505 (for engine mount)
- 4 — short control forms, Goldberg #441 (ailerons, rudder, elevator)
- 1 — set 36" long flexible NyRod, Sullivan #503 (ailerons)
- 1 — set 36" long semiflexible NyRod, Sullivan #505 (rudder & elevator)
- 10 — #2-56 link rods with clevis (i.e., Goldberg #351)
- 4 — #10-32 nylon wing bolts (fuselage strut anchors)
- 4 — 5/32" landing gear straps, Du-Bro #239
- 2 — 1/4" x 20 x 2" nylon wing bolts, Du-Bro #142 (wing hold-down)
- 1 — 6 ounce fuel tank, Sullivan SS-6 or equiv.
- 4 — #4 x 3/8" hex. head sheet metal screws (wing struts)
- 15 — #2 x 1/2" sheet metal screws (cowling)
- 13 — small nylon hinges, Du-Bro #119 (ailerons, rudder, elevator)
- 2 — packs 4" x 72" auto. fiberglass cloth and resin (cowl)
- 1 — pair 3 3/4" wheels, Williams #120
- 4 — mini-snap clevis, Goldberg #210 (struts)
- 4 — 1/4" x 1/2" x 14" preformed spruce struts, or 1/4" x 1/2" x 56" pine screen mold available at local lumberyards.
- 1 — 1/2" x 6" length of steel banding, available at local yards (usually at N/C) (strut ends)
- 3 — bulkhead fittings, Fourmost Products #121 (connect fuel tank to engine and muffler)
- 1 — Tatone EM-40B #11233 muffler, an adapter plate will have to be made for a K&B .40 engine. Also add a pressure fitting to the muffler.
- 2 — rolls aluminum #205 MonoKote
- 1 — 1/16" x 6" music wire (tail skid)
- 1 — 1 ounce bottle medium CA
- 2 — 1 ounce bottles thin CA
- 1 — 12 x 4W Zinger prop (11 x 6 is second choice)
- 1 — Pactra Formula-U aluminum #20077, 4 ounce (cowl)
- 5" x 12" pieces of red and white trim sheets or Polish insignia decals
- 2 — 1 ounce bottles (tubes) 5-minute epoxy



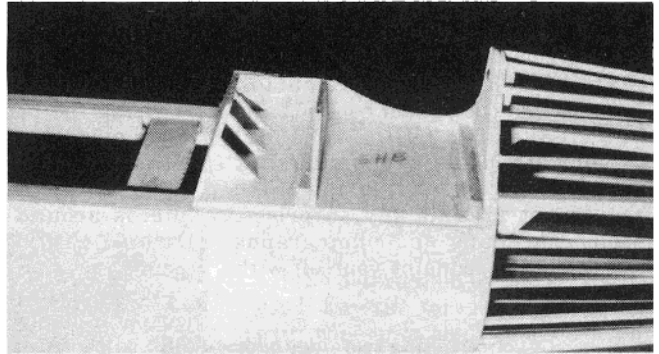
Pin sides over plan and install cross braces. Tack glue top braces at "B" and "E" (marked with an X). These are to be removed after sheeting the sides.



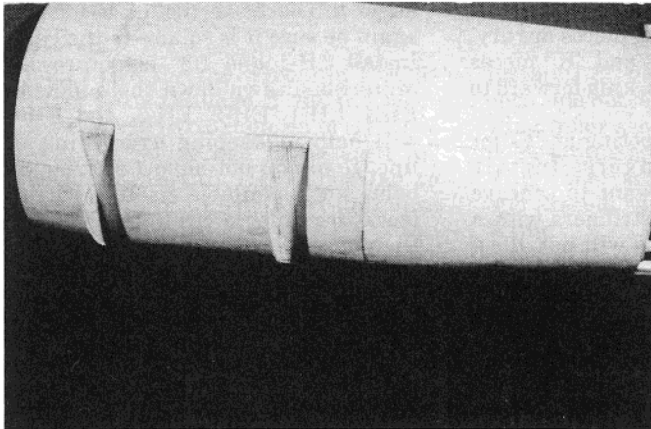
Soak sheeting balsa in water. Wrap wet balsa around a 3 pound coffee can. Hold in place with rubber bands.



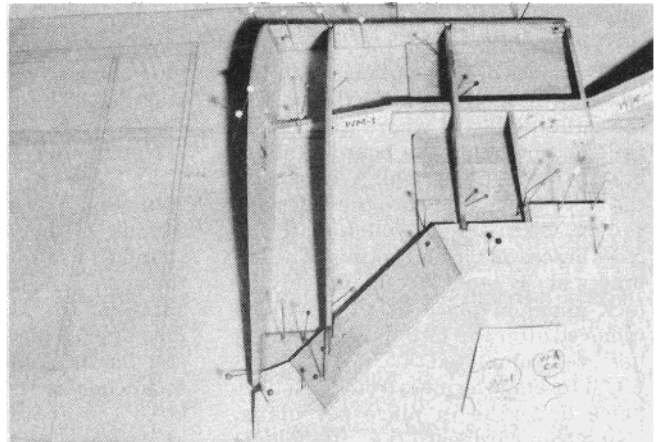
With top braces at "B" and "E" removed, there is plenty of room for equipment. Plywood reinforcement is optional.



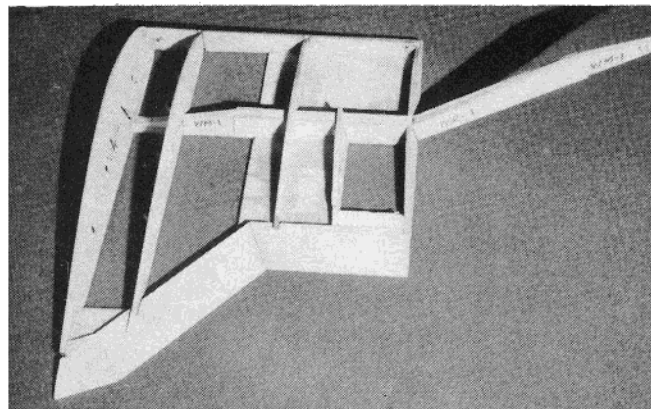
Inside detail of equipment hatch (EH-).



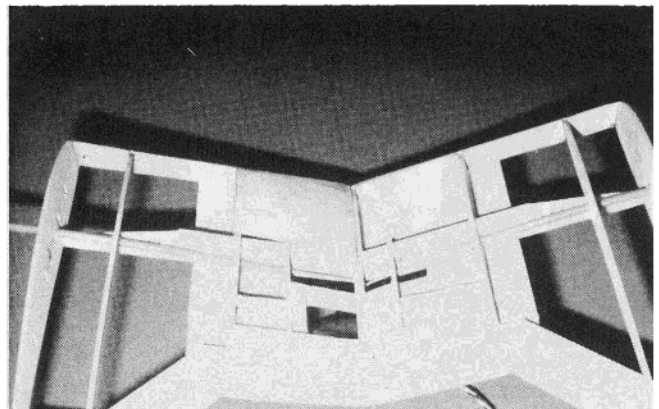
Landing gear recesses.



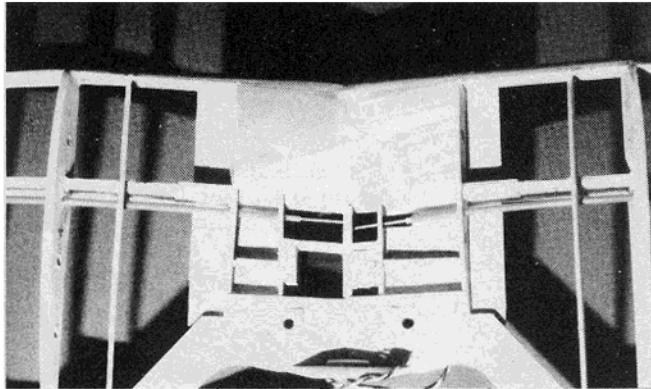
Left wing inner section on the board. Servo opening to be determined by servo to be used. Build spar unit first.



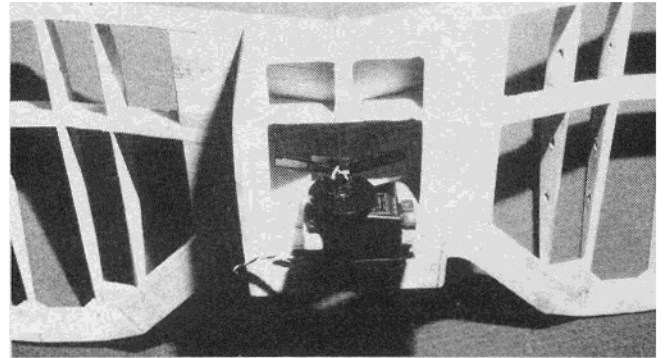
Completed left wing inner section. Servo opening to be determined by servo to be used. Build spar unit first.



Test fit NyRods to completed wing inner section. Test fit inner section to wing hatch (WH-) unit. Do not glue the two together at this time. Make any changes and adjustments necessary to get equal heights at the W-4 ribs.



to the wing hatch (WH-) unit. Note that the NyRods have been installed and only the front portion of the wing is sheathed.



3/8" x 3/4" balsa servo supports and servo. Servo wheel should be trimmed so it does not extend below servo during full servo operation. Servo mounting supports should be cut off even with bottom of servo.

construction, it should be pointed out that the following information assumes that the builder has the basic knowledge and skills of model building. If you have ever built a stick type model, constructing the P-11c should not present any surprises. Study the plans and photographs thoroughly to acquaint yourself with the plans.

Fuselage:

Begin by constructing two sides over the plans. The use of thin CA makes this a fast job. After the two sides have been built, taper the tail end of each side (see top view of plans) so the total thickness at the tail is 1/4". Assemble the two sides over the plans using the cross pin method of holding the sides to the building board where the bottom rails do not touch the board. Rubber band in place sub firewall A-1 between the sides at "A". Be sure the sides are square with A-1 as you install the cross braces on top and bottom. The top braces at "B" and "E" should only be tack glued in place as they will be removed after the 1/16" balsa sheeting has been completed.

Cut fuselage formers from 1/8" sheet balsa and glue in place per plans. Using thin cardboard (i.e., file folder) cut patterns for fuselage sheeting. One

set for "A" to "B", one set for "B" to "D", and one set for "D" to "F".

Using the patterns, cut out pieces from a 1/16" x 3" x 36" balsa sheet. Soak the balsa pieces in water for about 30 minutes, then wrap wet pieces around a 3 lb. coffee can, holding them in place with rubber bands.

While the balsa pieces are drying, cut out filler pieces "K" from 1/8" x 3" x 36" balsa sheet. Glue them in place along each side of the fuselage top from "A" to "F". When glue is dry, shape "K" pieces to conform to fuselage formers.

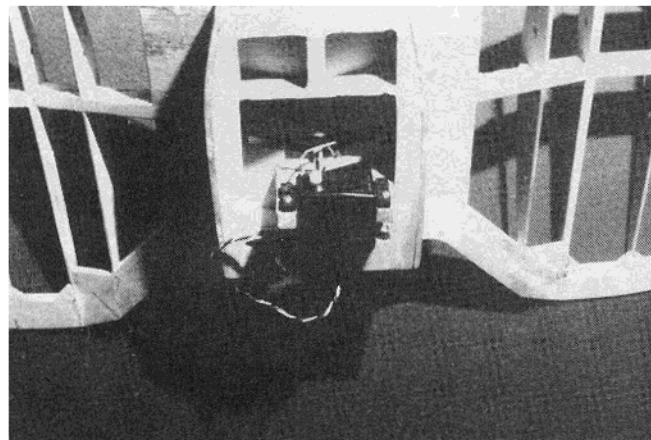
When 1/16" sheeting pieces are dry, glue them to formers and "K" pieces starting at "F" and working forward to "A".

Notch out 1/16" sheeting at "F" for 1/18" x 3/16" stringers. Install stringers. You may want to concave former "G" between stringers with a round file so the balsa will not affect the appearance of the covering when it shrinks. Install filler "L" between fuselage "J" pieces. Filler "L" acts as a stop for the front of the stabilizer and an anchor for the fin. Install planking (1/16") in appropriate areas between stringers rearward of "H" for supporting rudder and elevator

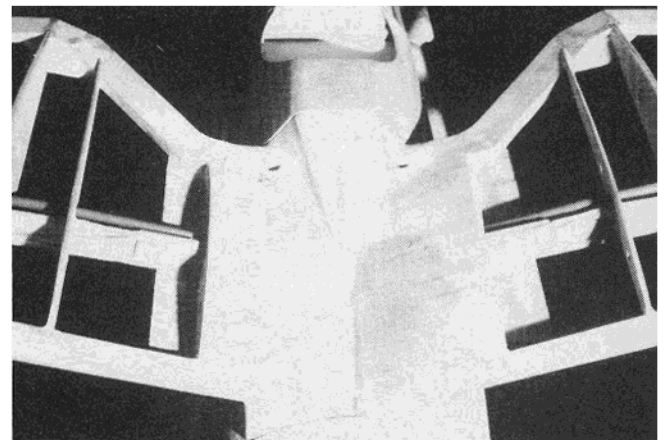
NyRod exits. Shape "J" pieces to conform to former "H" and tailpost.

Remove temporary top cross braces at "B" and "E". Cut out a piece of 1/4" plywood for the firewall; it should be about 5 1/2" in diameter. Draw both horizontal and vertical centerlines on one side to help line up the motor mount. Glue it to the sub firewall A-1 and formers at "A".

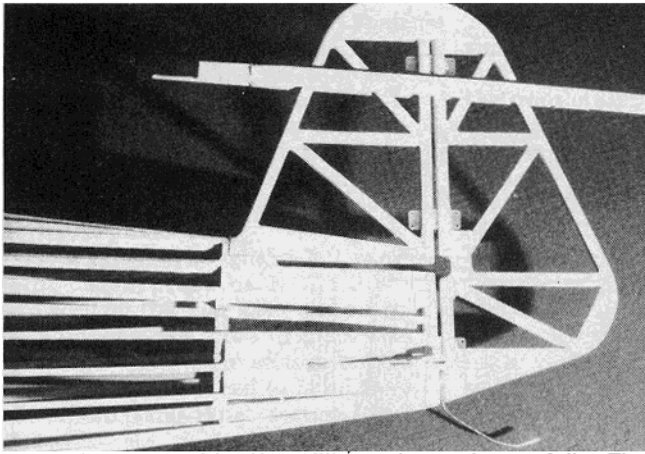
Next build the Equipment Access Hatch unit (EH-). Cut a piece of 1/8" plywood 4-3/16" wide and 5 1/2" long for the base (EHB). Glue EH-3 to one end of EHB and be sure that it is at right angle to the base. Install EH-2 and again be sure it is square to the base. Install EH-1 and 1/8" ply braces. A centerline drawn down the middle of EHB, EH-1, EH-2, EH-3, and EH-4 will help in keeping everything in line. If you do not have 1/4" triangle balsa stock available, use 1/4" square stock to reinforce EH-2 and EH-3 at their bases. Cut a piece of 1/8" plywood 3/4" x 3" for EH-4. Glue this to the bottom front edge of EHB allowing it to project out 1/4" to act as the front hold-down for the equipment access hatch. Make and install a headrest to the top of EH-3. Drill a hole through the headrest, EH-3, and F-T for a #2 or #3 woodscrew. This will be the rear



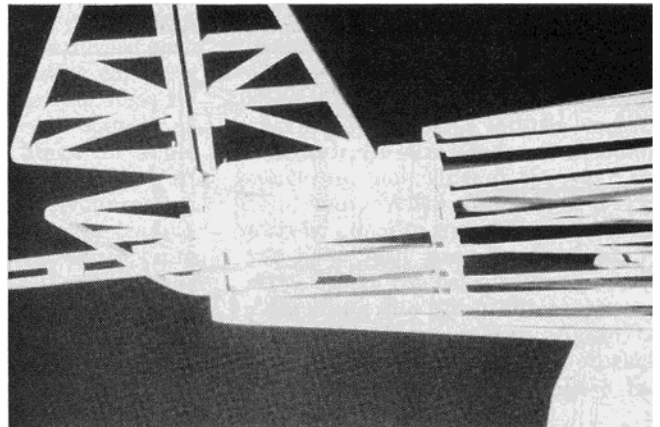
Aileron servo without servo wheel. Wing attached to wing hatch (WH-) unit.



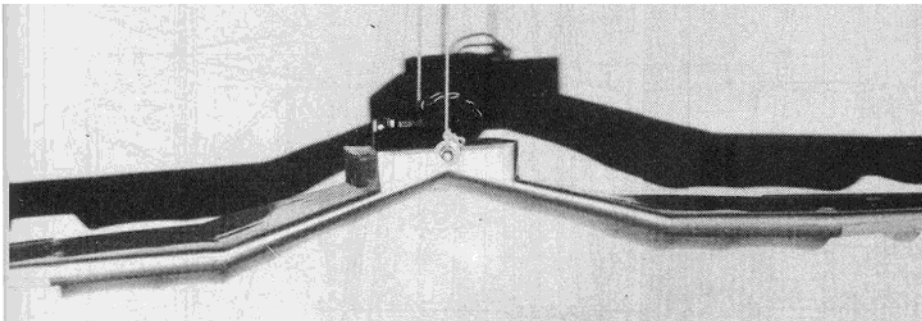
After the servo installation has been completed, complete sheeting the top of the wing and build the wing fairing as shown here.



Fin-rudder assembly. Note filler strips at base of fin. The drawings show 1/8" x 1/4" angle braces. This change from the 1/4" square braces shown here was made to keep the tail assembly as light as possible.



Stabilizer-elevator assembly. The drawings show 1/8" x 1/4" angle braces. This change from the 1/4" square braces shown here was made to keep the tail assembly as light as possible.



Balance wing before covering top outer sections of wing.

hold down for the EH-unit. Test fit EH-unit to fuselage. Trim and taper the base (EHB) to conform to the sides of the fuselage and allow for 1/16" sheeting. Install 1/16" sheeting to sides and top. Fasten EH-unit into position on the fuselage.

The plans are self-explanatory for building the Wing Hatch (WH-) unit. You can match the angle of WH-4 with EH-1 by placing a piece of wax paper between the fuselage sides, WHB, and the front of EH-1. This will keep the CA from getting to these areas. After the sub assembly has been made,

install 1/8" balsa sheeting strips to each side but leave the top open for the wing inner sections. **Do not** drill the holes for the hold-down bolts until the wing inner sections have been built and assembled to the WH-unit.

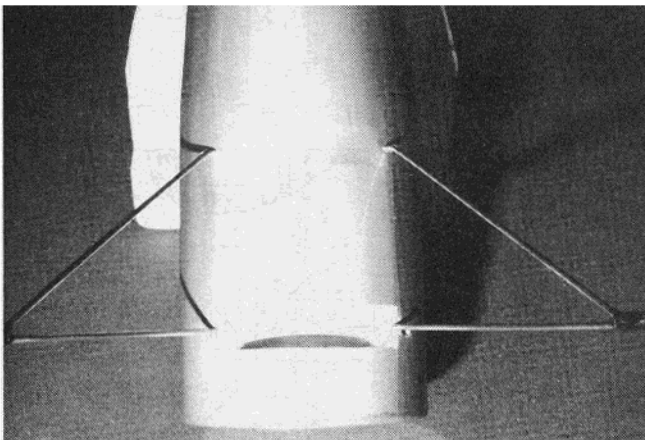
Wing:

Using patterns from the plans, make (1) two sets of leading edge section from 3/8" x 3/4" medium hard balsa sticks or reshape equivalent sized flat bottom airfoil leading edge material. A good razor planer makes this a fairly easy job. Be sure to cut in the slots for the ribs; (2) two sets of

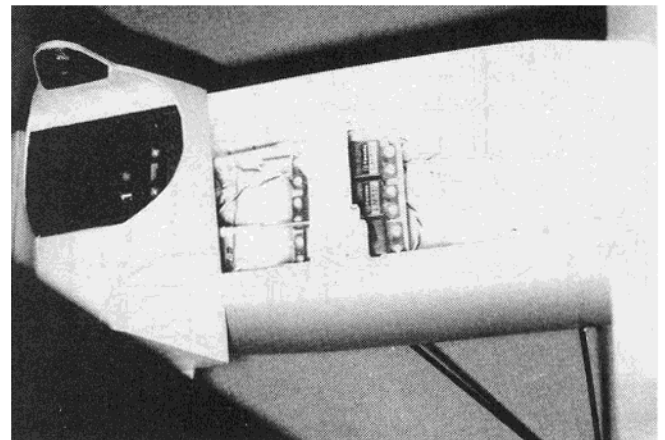
main spar parts WM-1, WM-2, and WM-3; (3) main spar reinforcement plates WR-1, WR-2, and WR-3; and (4) two sets of wing ribs. Be sure to cut out four W-4's and four W-6's.

Before starting wing construction, select the actual aileron servo to be used because the wing servo opening will be determined by the servo to be used. Lay the servo flat on the plan with the servo shaft pointed toward the front of the wing. Install a servo arm on the servo shaft with the arm up. Connect the servo to your receiver and with the radio set turned on, check the actual operation. Change the position of the servo so that it operates correctly. If you have servo reversing radio equipment, this process is not necessary.

Again, lay the servo flat on the plan in the correct position with the servo shaft pointed forward. Align the centerline of the shaft with the outer edge of W-1 (the centerline of the wing). Mark on the plan the location of the end of the servo. Then measure over 3/8" toward rib W-2. This will be the location of W-1A. Repeat this procedure for the other half of the wing inner section for the location of W-1A in that section.



Landing gear installed in recesses. Attaching covering material to a piece of thin cardboard will prevent covering from concaving, as shown here.



Battery on fuse floor between servos and firewall. Fuel tank goes on top of battery. Receiver placed on edge rearward of servos. On-off switch and charge receptacle on bottom of equipment hatch.

Build the wing inner section spar over the front view plan of the wing dihedral. Pin the WM-1 pieces to the plan. Glue one WR-1 to the WM-1 pieces. Make sure this unit is completely straight (or flat). When glue is dry, remove spar from plan and glue the other WR-1 to the other side of the WM-1 pieces.

Using either the right or left wing plan, cut a piece of 1/8" x 3/8" hardwood for the spar base, and pin to the plan. Pin and glue in place the reinforced WM-1 spar section to the hardwood base. Proceed to build that half of the wing inner section. The 1/16" balsa sheeting for the bottom should go between the hardwood base and the back of the leading edge and the front of the 1/4" trailing edge. Be sure to allow for the servo opening as determined earlier. Make an angle guide for correctly setting rib W-4. At this point, only sheet the front section of the top from the spar to the leading edge. Using the same procedure, build the other half of the wing inner section. The height to the bottom of W-4, at the spar, of the completed inner section should be 3/4" from the building board.

When building the mid sections, only spot glue ribs W-4 and W-6 at the leading and trailing edges. This will allow you to adjust them to match their corresponding rib when you assemble the wing for the correct dihedrals. Be sure you leave adequate space on each side of the spar for reinforcers WR-2 and WR-3. These may be glued to the center spar after you have built and removed the mid section from the board.

Building the wing outer sections should be self explanatory. Again, be sure to leave adequate space on each side of the spar at rib W-6 for reinforcer WR-3.

Before assembling the five wing sections, test fit them to make sure everything will match up. Remember, the leading edge tapers! Make sure the spar of the wing is straight across from tip to tip. The spar of the inner section should slide between the WR-2s and under the WM-2 spar of the mid section. The WM-3 spar of the wing outer section should slide between the WR-3s and over the WM-2 spar mid section.

Cut a piece of NyRod outer sleeve long enough to go from rib W-1A through rib W-7. Slide one end of the sleeve through the holes of the inner section ribs and just through W-1A into the servo area. Do the same with another piece of NyRod sleeve for the other half of the inner section. Set the inner section on a flat, level surface.

Block up each side so you have equal dihedral on each side at ribs W-4. Then slide the completed mid sections along the NyRod sleeve until the W-4 ribs join. Prop up the W-6 ribs for the correct dihedral. Adjust the spot glued W-4 ribs of the mid section to match the W-4 ribs of the inner section. Recheck the spar for straightness. When everything lines up, glue ribs W-4 together. Re-glue the previously spot glued areas. Using thin CA, glue the WR-2s to WM-1s and the hardwood base. Use the same procedures for joining the wing outer sections to the mid sections. When all glue joints are dry, use epoxy to glue the NyRod sleeve to the ribs.

Insert NyRod rods into the NyRod sleeves and complete the installation of the bell cranks. Using two pieces of #2 link rod or 1/16" wire, make the NyRod to servo arm connectors as shown on the wing front view. Do not glue wire into NyRod until after the servo has been installed.

Set the Wing Hatch (WH-) unit on a flat, level surface. Center the wing inner section on the WH-unit. Trim and fit the WH- unit to the wing so there is zero incidence between the front and back of the wing. The distance up to each wing tip should be the same. Glue the two units together using Titebond or regular epoxy. The opening in the WH-base will help you get good glue joints.

Install 3/8" x 3/4" balsa servo supports per the drawings. Install the servo. Trim the servo wheel to the shape shown and drill two holes for the connecting wires. Using epoxy, attach wires to NyRod and attach servo wheel to servo as quickly as possible. Connect servo to radio equipment. Check to be sure the ailerons work correctly.

Drill holes in wing strut anchor blocks for the #4 hex head sheet metal screws. Thread holes with the screws.

Go back and finish sheeting the top of the wing inner section. Attach Equipment Access Hatch (EH-) unit to fuselage. Place wing assembly on fuselage. Using a flexible straight edge, draw lines over top of wing for each side of the wing fairing. Drill 3/16" holes through the wing and 1/4" plywood fuselage top brace at "C" on each side of the fairing location for the 1/4"-20 nylon wing bolts. If you have used lite plywood, put some thin CA in the threaded hole. Then run the tap through the holes again when the CA has dried.

Tail Sections:

Construction of the fin, rudder, stabilizer, and elevator is straight forward "stick" construction. Just build them over the plans using the

materials shown. Be sure the trailing edge for fin and stabilizer and the leading edge for the rudder and elevator are straight. This will make the match-up with their respective counterparts easier to accomplish. Round all edges except the fin trailing edge and the edges of the fin opposite the rudder top. The same applies to the stab-elevator assembly.

Cut two triangle pieces of 1/4" balsa sheet and glue them to each side of R-4 at the base of the fin. Then trim them to match the fuselage.

Covering:

Before covering, I prefer to trial fit everything — hardware, engine, fuel tank, battery, radio, servos, landing gear, movable surfaces, etc. This way you can make changes and corrections without spoiling the covering. I prefer Super MonoKote for any model of open construction because of its added strength. Before covering movable surfaces (i.e., fin and rudder), I like to cover the matching surfaces with a strip of covering material. Then I install the hinges. This allows me to "pin" the hinges with toothpicks and not worry about getting adhesive in the pin area of the hinge. Except for the fuselage, use the covering procedures recommended by the manufacturer of the covering material. Also, I do not completely cover the top of the wing until I have balanced it.

When covering the bottom of the fuselage, one piece (cut to go from the sheeted area to the tail) will work fine. However, to do the sides and top from the cockpit to the tail, I found it best to use strips slightly wider than the width of the distance between the fuselage formers. Start at the tail and work to the cockpit.

Final Assembly:

Completely assemble the model, ready to fly including balancing, before making the cowl. The length of the cowl will be determined by the position of the engine on the mount.

Place stab-elevator assembly on the tail of the fuselage. Make sure the hinge line is at right angles to the centerline of the fuselage. Pin the stab to the fuselage.

Position fin-rudder assembly on top of stab, inserting the rudder bottom hinge into fuselage. Align sides of fin at right angles to the stab elevator hinge line. Draw lines on the top of the stab along the fin filler strips and on the bottom of the stab along the fuselage. The area between the lines will be the stab-fin glue areas. Make sure the fin and stab are at right angles. If not, make the necessary adjustments. Remove the fin-rudder

from the stab elevator. Trim away any covering between the lines drawn on the stab.

Using Titebond or regular epoxy, glue the stab to the fuselage. Be sure the stab is at right angles to the tailpost of the fuselage. When glue is dry, glue fin-rudder to stablizer. Be sure the fin is at right angles to the stab and that you have glued the bottom hinge on the rudder to the fuselage.

Install landing gear. Using thin cardboard (i.e., file folder), cut two pieces to fit the contour of the fuselage. Cut them just wide enough to go between the fuselage formers. Notch out ends for the 5/32" wires. Cut pieces of covering material about a 1/4" wider than the cardboard strips. Attach covering to cardboard. Then attach them to the fuselage making sure the cardboard fixes between the fuselage formers.

Attach equipment hatch and wing to fuselage. Set model on a flat, level surface. Block-up tail of model so the bottom of the wing at the wing hatch is level. Check to see that stab is level (zero incidence).

Check to see that the wing and stab are laterally parallel by measuring from the level surface to the ends of the stab and wing tips. Any corrections will have to be made to the wing hatch unit.

Remove wing and equipment hatch. Install battery pack, fuel tank, servos, receiver and wheels. Due to the short nose section, all equipment will have to be as far forward as possible. Reattach equipment hatch and wing. Using rubber bands or some other suitable method, strap engine to the motor mount in the position shown on the plans. Remember to attach prop and spinner to engine. Balance the model on the center of the spar. Balance (without cowl) should be about 1° nose heavy. With the engine in the position shown on the plans, I found that I had to add 1 oz. of lead to the back bottom of the firewall. Instead of adding the weight, you may opt to move the engine forward on the motor mount to obtain the desired balance. Remember, where you place the engine will determine the length of the cowl. Measure the distance from the front of the firewall to the back of the prop drive washer. Add 1/16" to this measurement. This will be the length of the cowl. Mount the engine to the motor mount. My model flew well without any down or right thrust.

If you do not have a preference for constructing the cowl. I would suggest

you make one of fiberglass. I used the styrofoam plug method with two layers of automotive grade fiberglass cloth and fiberglass resin. Today there are sandable epoxies that are said to be easier to use than fiberglass resin. I used a knife to dig out the foam after the resin was dry.

The cowling is mounted to five "L" brackets made from vinyl "C" channel available from a vinyl siding business. Pactra Formula-U aluminum paint will match the MonoKote aluminum very well.

Flying:

If you have kept the weight down, your P-11c will fly very well with no bad habits. Take-offs are quite straight. Just gradually increase the throttle until the tail rises off the ground. Keep it level with the elevator and it will lift off when it reaches flying speed.

On first flights, I prefer all the control surface throw I can get. Then when I see how the model reacts, I readjust the throws to those that work the best.

The K & B .40 with the 12 x 4 prop will give the P-11c very realistic flights. Good luck, and enjoy flying your P-11c.

References

- Cynk, J.B. and Z.A. Datkiewicz. "Poland's Greatest Fighter, PZL P-11c." *Aeromodeller*, June, 1960.
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