

# NORTHROP GAMMA

**BACKGROUND:** The original Gamma, created for Frank Hawks, was equipped with a Wright 14 cylinder engine of 785 horsepower. Its top speed was approximately 248 miles per hour and thanks to efficient wing design and generous flaps, it could land at a mere 40 to 55 miles per hour. Range at cruising speed was 25,000 miles, allowing non-stop coast-to-coast flight capability.

Dr. Lincoln Ellsworth ordered Gamma number two, with Antarctic exploration in mind. This twin-seater variation was powered by a Pratt & Whitney Wasp single-row engine.

Designer John Northrop's innovations had far-reaching effects on the aircraft industry. Such machines as the Douglas DC-3 and Douglas Dauntless were direct descendants, employing structural techniques developed for the Gammas. Northrop was a wing designer par excellence, and gained later fame for his "flying wings", which were unfortunately hampered by political interference, preventing development to full potential.

**NOTE:** This kit may be used to construct either Frank Hawks' "SKY CHIEF", or Lincoln Ellsworth's "POLAR STAR". Decide at the outset which variation will be modeled. These aircraft were frequently modified, and photographic evidence indicates a succession of minor changes. We have attempted to portray the more important ones in graphic and tabular form. Configurations at certain points in time have been arbitrarily labeled by "phases". Some changes were so minor as to be inconspicuous in small scale. Markings style and colorations seems also to have varied. For example, the Northrop emblems may have been different colors on different aircraft. Dedicated researchers may care to consult published reference material, or perhaps seek additional information on their own. Be aware, however, that a great deal of misinformation, particularly in the guise of photo captions, has appeared.

**IMPORTANT: READ BEFORE STARTING ASSEMBLY!** This model should be approached with patience and care. Check the fit of each part BEFORE applying cement.

**GENERAL INFORMATION:** Before assembly, clean all parts in lukewarm water and liquid detergent, so that paints may adhere properly. Liquid-type styrene cement is preferred, and may best be applied with a fine-pointed brush. Avoid using excess cement, which may damage the plastic's surface.

For best results when brush painting, use sable-hair types. Use only paints which are recommended for plastic. Aluminum finishes are best applied by spray, rather than brush. Small parts may be painted while still attached to their "trees". Carefully detach parts, using a sharp modeling knife. Separate only as needed to reduce risk of loss. Remove any "flash" which may be present, and using a sanding block, dress all mating surfaces until they match perfectly. A suitable sanding block can be made from #400 sandpaper, contact-cemented to a scrap of wood. When cementing components onto already painted surfaces, first scrape off the mounting area paint, to permit good adhesion.

**NOTE:** References to locations assume looking forward from the cockpit of the aircraft. Port is on the left-hand side and starboard on the right.

**PAINTING:** There are several possible approaches to painting. Some builders prefer to assemble a model, mask off any surfaces not to be painted, then spray the entire assembly. Then the remaining areas, except windows and clear parts, are finished with a brush. Alternatively, components may be painted before assembly, except for those which may require seam filling or smoothing. Each method has advantages and disadvantages, but either can be made to work effectively. Remember that regardless of technique, patience and care are required to obtain a superior finish.

**COLOR INFORMATION:** The box cover painting may be used as a general guide to finishing the SKY CHIEF. However, be aware that this aircraft underwent modifications in both configuration and markings. Consult Phase Chart and illustrations for specifics.

**OVERALL:** Natural aluminum (both SKY CHIEF and ELLSWORTH)

**TIRES:** Flat dark grey

**PROPELLERS:** Polished metal. Rear of Ellsworth's flat black.

**EXHAUSTS:** Steel

**ENGINES:** Grey crankcases; black cylinders.

**INTERIOR:** Light green; leather upholstery; aluminum control stick with brown grip.

**WING TIP LIGHTS:** Green starboard; red port.

Remainder of markings are applied with furnished decals. See illustrations for placement guidance.

**FUSELAGE:** After determining which Gamma you wish to build, study the differences carefully, with the aid of the Phase Chart and illustrations. This is important, since some operations must be performed in advance of assembly. For example, if you elect to construct a version with fuselage side windows, the openings must be made in the proper locations BEFORE cementing fuselage halves together. Using illustrations and lines on inside of fuselage sides as guides, trim out the window openings, using a sharp modeling knife. Small files are useful for smoothing the edges and rounding out the corners. Check, using the windows (1, two pieces), removing only small amounts of material at a time, until the fits are perfect.

Paint fuselage interior. Cement side windows in place, but mask them on the outsides to prevent scratching or accidental painting during subsequent operations. Add the instrument panel decal before cementing panel (2) in position. Paint and install remaining interior details including control stick, (3) seat, (4) (SKY CHIEF) or seats (4 and 5) (ELLSWORTH) to the floorboard (6) and cement assembly in one side.

Pre-assemble fuselage halves to check fit before applying cement. If satisfactory, apply cement to mating edges and place halves together. Rubber bands and masking tape are useful for holding parts in firm contact while drying. Install turtleback (7) full-length for a SKY CHIEF, filing to fit if necessary. Shorten for an ELLSWORTH two-seat variation, as illustrated.

Add upper fuselage strip (8) "as is" for an ELLSWORTH model, or modified as illustrated, for a SKY CHIEF. The windshield canopy should be temporarily taped in position while fitting this strip.

If constructing an ELLSWORTH Phase I, remove fairing between rudder and fuselage tail cone, with a modeling knife and files.

If modeling SKY CHIEF Phase II, or ELLSWORTH Phase II, the fin/rudder may be left "as is", except for slight modification to the trim tab (see illustrations). For SKY CHIEF Phase I or ELLSWORTH Phase I, the fin/rudder will need to be shortened and reshaped as illustrated. For SKY CHIEF Phase III, the rudder will require slight filling of the vertical separation line, and re-scribing for the balance portion of the rudder. (See Phase Chart and illustration).

Determine the correct fuselage extension, cowling and engine for your model. If a SKY CHIEF is chosen add extension parts (9, two pieces) to the front of the fuselage and cement in position. For ELLSWORTH model, parts (10, two pieces) should be installed.

Next, select the appropriate cowling parts (SKY CHIEF: 11, two pieces), or (ELLSWORTH: 12, two pieces). Cement halves together, smooth seams, and paint. Paint and install the correct engine (SKY CHIEF: 13 and 14) or (ELLSWORTH: 15), into cowling. Paint propeller (SKY CHIEF: 16) or (ELLSWORTH: 17), and insert shaft into engine crankcase. Carefully cement propeller retainer (18) onto rear of shaft. CAUTION: Do not use excessive cement, or propeller will not turn freely. Tweezers may be helpful in positioning prop retainer. Finally, cement engine/cowling assembly to front of fuselage.

**WINGS:** Determine the appropriate wing/aileron configuration for your model, referring to the Phase Chart and illustrations. Note that the ELLSWORTH II inset aileron version will require the following modifications: First, sand or file off flap stiffeners from the lower side of wing in aileron areas. Next, scribe in the aileron outlines, using the full size drawings for location and size. Note that the ailerons are narrower in chord on the upper surface than on the lower. A metal straight-edge plus a scribing tool are suggested for this operation. An additional stiffener strip may be added alongside each aileron, made from scrap plastic. Lines representing the fabric-covered aileron ribs may also be lightly scribed in if desired.

Assemble wing halves with cement, using rubber bands and tape to secure while drying. Check fit of landing lights (19, two pieces) in wing leading edges. These may be cemented in place at this time and masked for protection, or installed later, after model painting.

**LANDING GEAR:** Paint the wheels (20, two pieces), place them onto landing gear trouser half (21) and (22) axles, and carefully cement on opposite halves, (23) and (24). Cement landing gear assemblies onto lower surface of wings as illustrated.

**ASSEMBLY:** Check fit of wing/fuselage assemblies, and when satisfactory, cement together, checking alignment as viewed from top and front.

Fit stabilizer halves in place and cement, being certain they are in correct alignment.

If "Park Bench" type ailerons, (25, two pieces), are to be fitted, they may be installed at this time. Note that Phase III SKY CHIEF featured three aileron supports, (26, six pieces) per aileron, rather than the usual two.

Select appropriate tail wheel (SKY CHIEF: 27, ELLSWORTH: 28) and install. Note that the boot will need to be carved or filed off for a Phase I ELLSWORTH version.

Add exhaust stack extensions if ELLSWORTH II type is being modeled. Note: For greater realism in any version, exhaust openings may be painted flat black or drilled out. Select the appropriate canopy (SKY CHIEF: 29 or ELLSWORTH: 29 and 30), check fit, adjusting if necessary, paint frames and install.

Choose the correct pitot tube from the three types shown. Fabricate from thin wire (not furnished) and install in drilled hole, located as shown in illustrations.

**DECALS:** The furnished Micro Scale decals must be handled carefully for best results. Each decal should be trimmed out separately, and applied as noted on the sheet. Avoid getting decals folded back upon themselves. The makers of the decals suggest the use of other Micro Scale products such as Micro Set, Micro Sol, and Micro Coat for best possible results. Directions for use accompanies each product.

**CONVERSIONS:** It is possible to convert this kit to other Northrop Gamma Variations. See references if you are interested in additional information. The float or ski equipped ELLSWORTH aircraft, for example, would be relatively simple.

Along more difficult lines, one might consider converting the kit to a "D" type, as employed by T.W.A., which would involve changes in the cockpit, cowling, rudder, elevator and other details. Then too, a military type "C" would be an interesting project.

For a truly different but somewhat formidable conversion, consider the Curtiss Conqueror engine Gamma, constructed for aviatrix Jacqueline Cochran.

Other Gamma were sold to England (type 2L) and China (type 2E), which would offer scope for other conversions.

**PUBLISHED REFERENCES:** 1. Aero Digest, January, 1933  
2. Universal Model Airplane News, January, 1933  
3. Air Power, May, 1973  
4. Air Classics, December, 1970

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## PHASE CHART

**NOTE:** All versions of the "SKY CHIEF" employ the (11) cowl, twin-row engine, 3-blade propeller and (9) fuselage extensions. All versions of the ELLSWORTH Gamma use the (12) cowl, single-row engine, 2 blade propeller and (10) fuselage extensions.

**SKY CHIEF, PHASE I:** New, shortly after manufacture.

Single-seat cockpit. No windows in fuselage sides, and short fin/rudder. "Park Bench" type ailerons, with two supports each. Hanging type pitot tube mounted under port wing. X-12265 license markings on both sides of rudder, top of starboard wing, and bottom of port wing. Large "Texaco" emblems on top of port wing, and bottom of starboard wing. Tail wheel with pant. Cowl markings as indicated in illustration. Flush type wing-tip lights.

**SKY CHIEF, PHASE II:** After rework. (See kit box cover illustration)

Single-seat cockpit. Windows in fuselage sides. Tall fin/rudder (trim tab on upper trailing edge). "Park Bench" type ailerons, with two supports each. Horizontal type pitot tube (note configuration) mounted on leading edge of port wing. NR-12265 license markings on both sides of rudder, top of starboard wing, and bottom of port wing. Large "Texaco" emblems on top of port wing, and bottom of starboard wing. Tail wheel with pant. Cowl markings as in Phase III illustration. Flush type wing-tip lights. Air intake stack behind engine cowling at top (see also Phase III illustration).

**SKY CHIEF, PHASE III:** After additional rework.

Single-seat cockpit. Windows in fuselage sides. Tall fin with balanced rudder. (necessitating slight filling and re-scribing of model part). Trim tab on upper rudder trailing edge. "Park Bench" type ailerons with three supports each. Horizontal type pitot tube (same location and configuration as SKY CHIEF Phase II). NR-12265 and Texaco markings same as Phase II. Tail wheel with pant. Cowl markings as illustrated. External, streamlined type wing-tip lights, top and bottom of both wings. Revised emblems on turtleback. Air intake stack behind engine cowling at top. NOTE: Certain photos show the machine in Phase III configuration except WITHOUT balanced rudder, intake stack and tail wheel pant.

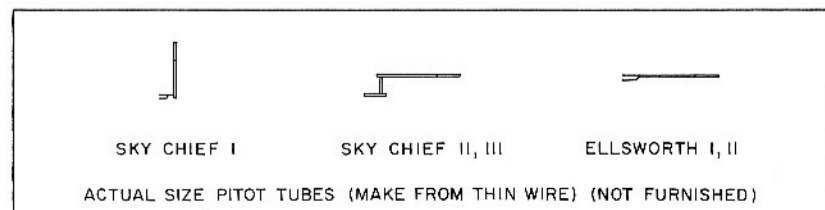
**ELLSWORTH GAMMA, PHASE I:** New, shortly after manufacture.

Two-seat cockpit. Windows in fuselage sides (but note slightly different location than SKY CHIEF). Short fin/rudder, no fairing under rudder. "Park Bench" type ailerons, with two supports each. Horizontal pitot tube (different configuration than SKY CHIEF'S), mounted in leading edge of port wing. X-12269 license markings on both sides of rudder, top of starboard wing, and bottom of port wing. "ELLSWORTH TRANS-ANTARCTIC FLIGHT" fuselage markings. Flush type wing-tip lights. Tail wheel without pant or fairing boot.

**ELLSWORTH GAMMA, PHASE II:** After rework.

Two-seat cockpit. Windows in fuselage sides. Tall fin/rudder with trim tab in different location than SKY CHIEF'S. Inset ailerons. Horizontal pitot tube (same configuration as ELLSWORTH Phase I). NR-12269 license markings on both sides of rudder, top of starboard wing, and bottom of port wing. "ELLSWORTH TRANS-ANTARCTIC FLIGHT" and "POLAR STAR" lettering on fuselage sides. Texaco emblems on fuselage both sides. Exhaust extensions added. External, streamlined wing-tip lights, top and bottom of both wings. Tail wheel without pant, but fairing boot added. Fairing added beneath rudder. NOTE: Ellsworth's aircraft was also equipped for float and ski installation.

The Ellsworth Gamma exists today in the Air and Space Museum collection of the Smithsonian Institution. Minor changes in detail and markings are in evidence, apparently incorporated since the Phase II reworking of the aircraft. Alterations have taken place in the rudder, and tiny "NO LIFT" signs appear on the stabilizer tips. The Northrop emblems on the fin are black with red birds.

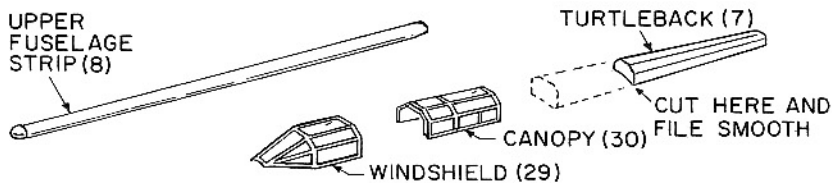




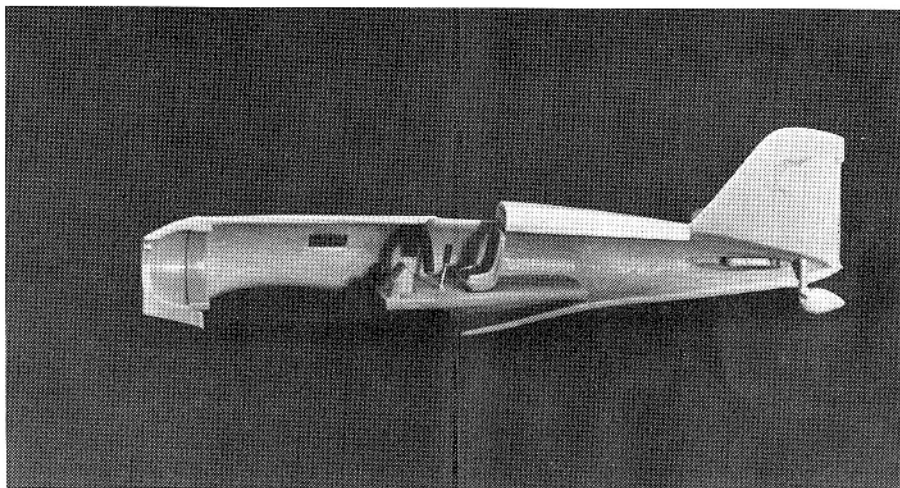
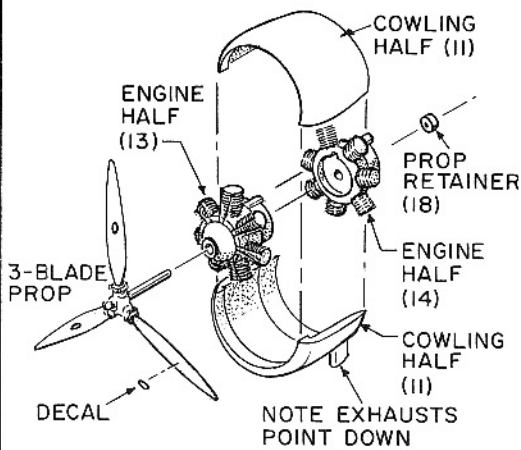
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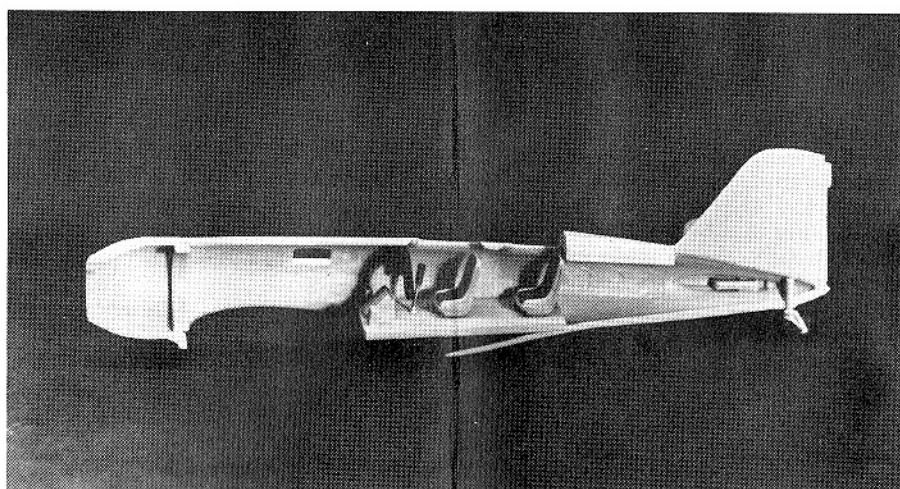
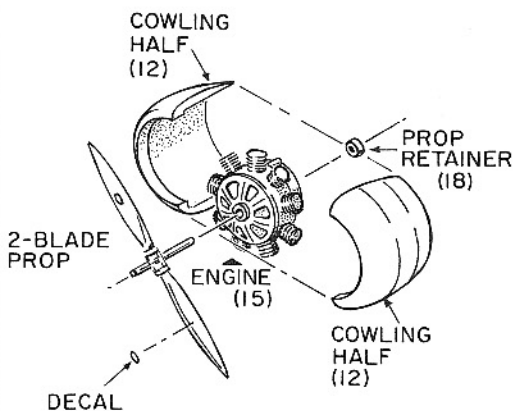
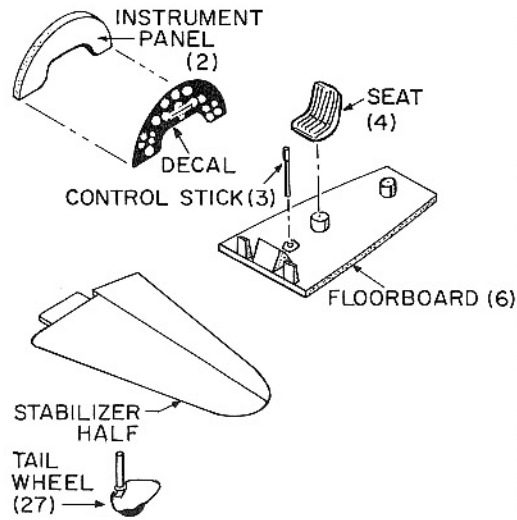
**"SKY CHIEF" COCKPIT COVER AND TURTLEBACK**



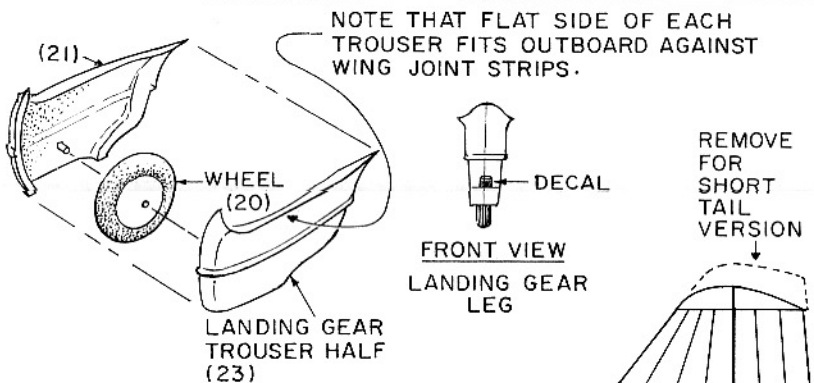
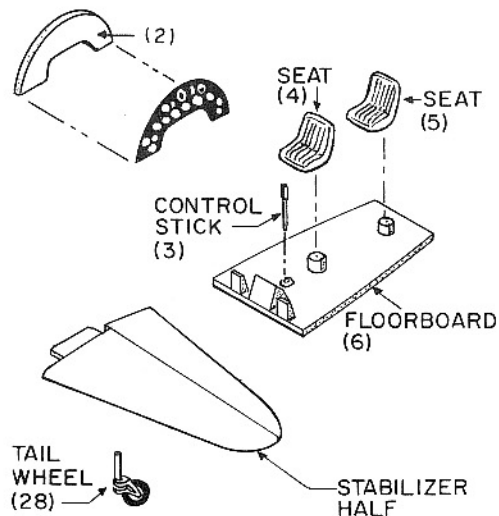
**ELLSWORTH COCKPIT COVER AND TURTLEBACK**



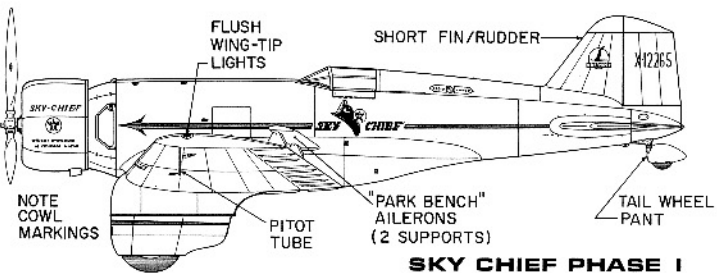
**"SKY CHIEF" COMPONENTS**



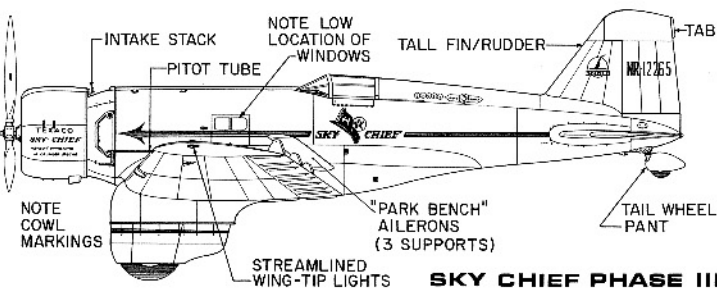
**ELLSWORTH COMPONENTS**



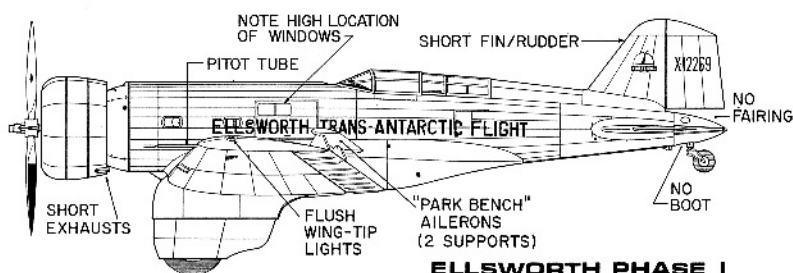
"R" AND "L" ON DECAL SHEET MEAN RIGHT AND LEFT AS VIEWED FROM COCKPIT FACING FRONT



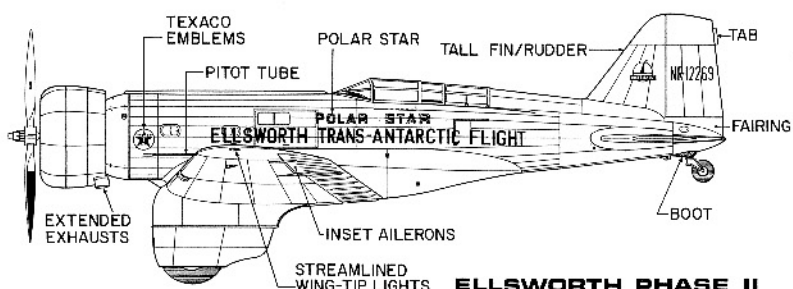
**SKY CHIEF PHASE I**



**SKY CHIEF PHASE III**

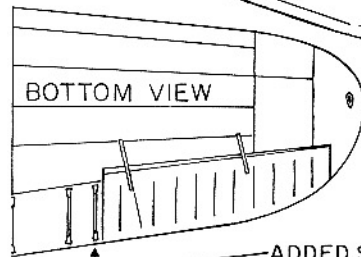
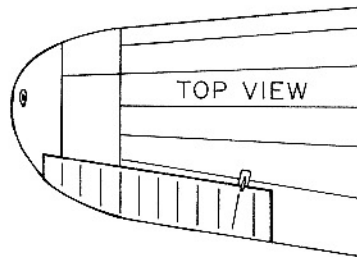
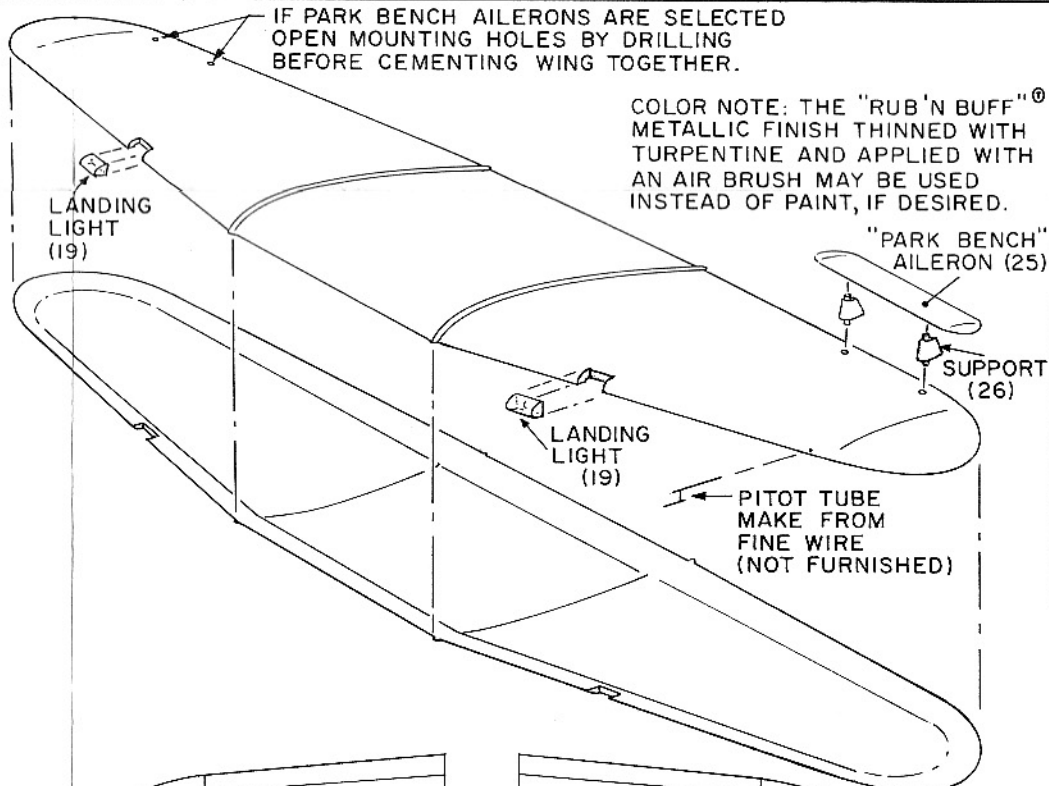


**ELLSWORTH PHASE I**

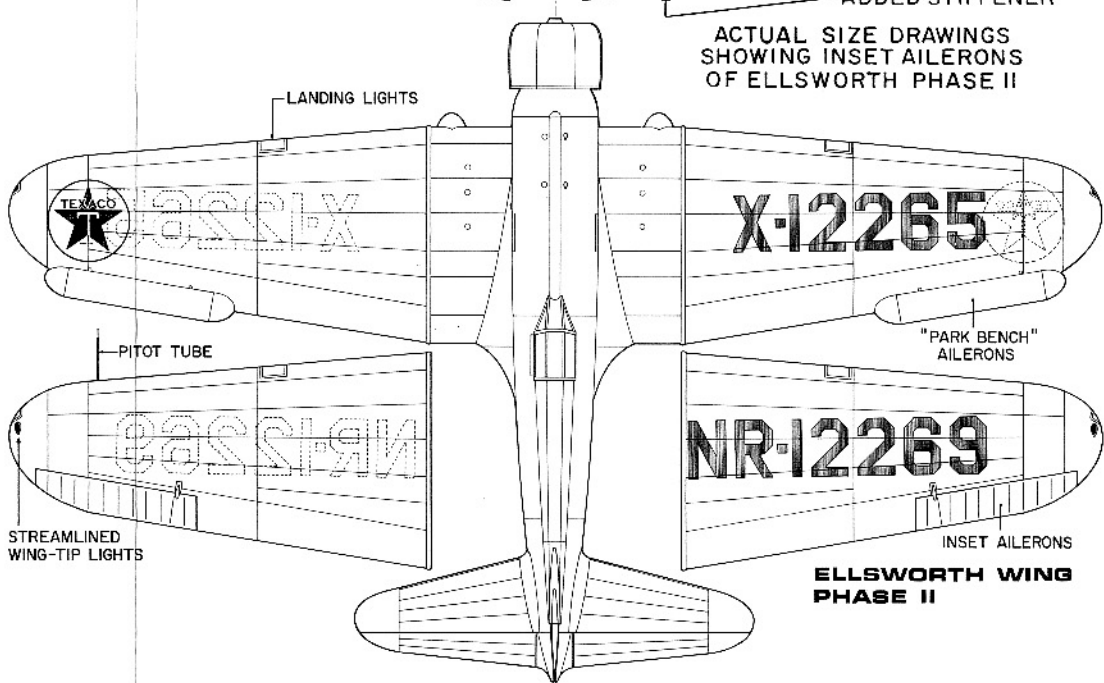


**ELLSWORTH PHASE II**

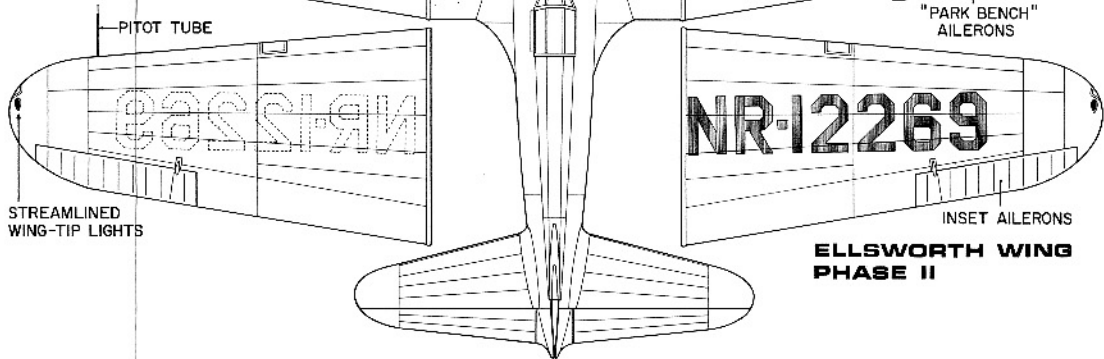
EXHAUST EXTENSIONS ARE IDENTIFIED "X" ON MOLDING



ACTUAL SIZE DRAWINGS SHOWING INSET AILERONS OF ELLSWORTH PHASE II



**SKY CHIEF TOP VIEW PHASE I**



**ELLSWORTH WING PHASE II**

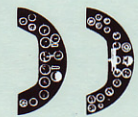
NR X-12269

NR X-12269

ELLSWORTH TRANS-ANTARCTIC FLIGHT  
ELLSWORTH TRANS-ANTARCTIC FLIGHT

POLAR STAR X-12269 NR-12269  
POLAR STAR X-12269 NR-12269

MICROSCALE



L  
TEXACO  
SKY-CHIEF  
WRIGHT WHIRLWIND  
14 CYLINDER MOTOR  
R  
TEXACO  
SKY-CHIEF  
WRIGHT WHIRLWIND  
14 CYLINDER MOTOR

L  
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SKY-CHIEF

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