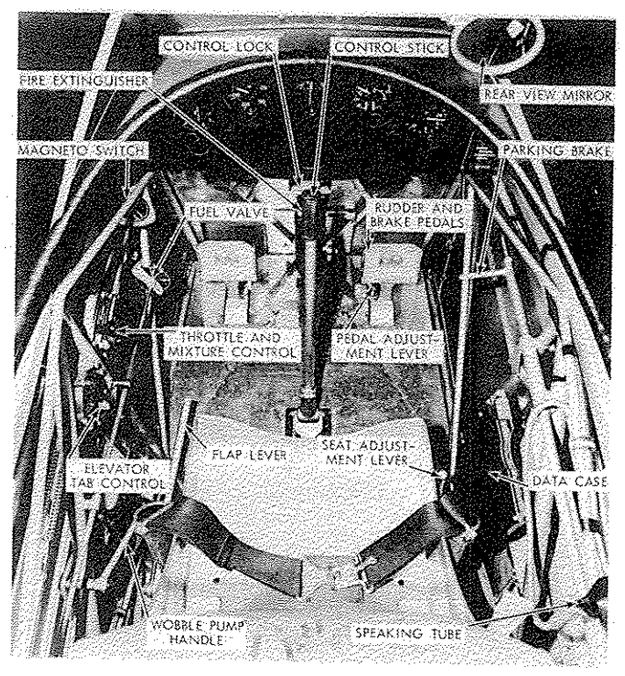
FAIRCHILD PT-19

DESIGNED BY CHUCK HOLLINGER
KIT DEVELOPED BY BILL DEAN

FOR MULTI, SINGLE CHANNEL R/C AND FREE FLIGHT
SUITABLE FOR CONTROL LINE CONVERSION • SPAN 72"
FOR .15 - .35 ENGINES • LENGTH 55" • WEIGHT 6 LBS.
WING AREA 820 SQUARE INCHES

Jetco MODELS®

C.A.ZAIC CO., INC. • 883 LEXINGTON AVENUE • BROOKLYN 21 • NEW YORK



SUPERSCALE KIT RC-1

Although low-wing scale designs are generally considered tricky subjects for model plane builders to tackle, there are of course exceptions to the rule—the PT-19 being a case in point. Fairchild engineers designed this primary trainer for the Army Air Corps in 1938, for which duties it had to be not only a sturdy ship, but also a forgiving one in which student pilots could learn the "feel" of a fighter with a minimum risk. Its low wing, wide-spaced wheels and low center of gravity assured excellent take-off and landing characteristics. The original model has exhibited this same ease of handling on all of its flights and it has never shown the slightest tendency to ground loop!

Under the cowl of the full size plane (the model is exactly 1/6 full size—or 2" to the 1' scale) was an inverted Ranger of 175 h.p. This marginal power didn't exactly make for VTO's; however, it was more than adequate for aerobatics. In fact it was while viewing some old Air Force instructional movies at a club meeting in which the PT-19 performed all the maneuvers—rolls, loops, Immelmanns, etc.—that I became convinced that here indeed was a plane worth modeling!

There were three configurations; PT-19, PT-26 and PT-23. The PT-26 was a Canadian-built version of the PT-19 except for the cockpit canopy, and was known as the "Cornell." The PT-23 was identical to the "19" except for a 220 h.p. radial Continental in the nose. After the war hundreds of these trainers were sold as surplus and can still be seen at many airfields around the nation.

Modelwise the PT posed but one major structural problem; how to handle the wing. This actually resolved itself into an asset after I decided to use a variation of the British "tongue and box" system. In this way the wing panels outboard of the landing gear are removable as on the real PT-19. By joining them with expendable balsa stubs the wings are protected under all conditions and the dihedral angle may easily be varied; 15 degrees for the first flights and straight plugs, 11 degrees after you've had a little "stick" time. This may seem like excessive dihedral—however, the full-size ship has 7-1/2 degrees in each panel. All photos show the model with straight plugs.

Since commencing work on the plane I have been surprised to learn that so many modelers have either trained in the full-size jobs during the war or owned one at some time. Earl Witt flew them and Earl Cayton says he still has a soft spot for the old PT-19, having learned to fly in one back in 1943. He says, "It got as low as 10 degrees below that winter and it got pretty chilly in those open cockpits". Talking with Jetco's Bill Dean at the '55 Nats in California (when the model was still taking shape on the work bench), Bill was enthusiastic about the PT-19 as an R/C job, since he was well aware of its favorable flying characteristics from a model point of view, having logged plenty of hours in the PT-26 (canopy version) with the R.A.F., in Africa in W/W 2.

After just nine test hops, we entered the model in a big meet at Yakima and I am pleased to say that she easily took first place in the multi-control event. This speaks well for both the flying qualities of the model and the reliability of the Babcock 2-channel equipment (which was used before the Babcock BCR-4A 3-channel receiver shown on the plans was installed). Underscoring these points is the fact that I had never before flown any kind of multi-channel ship. Actually, the vertical dive and inside loops (real smooth) on the winning flight were the first I had ever attempted. Soon after this, a PT-19 built from my plans by a friend won both the multi event and R/C flying scale at the '56 Pacific Northwest meet.

Over 350 flights in the course of two years with my previous R/C scale design, the Piper Cub J-3 (kit version also developed by Bill Dean), and something like half that amount with the PT-19, certainly proved the efficiency and reliability of the Babcock R/C equipment. Although the Babcock BCR-4A 3-channel receiver is no longer in production, it was decided to still retain it on the kit plans, since there are several thousands in modeler's hands around the world. My friend, Gene Britzius of Seattle, has been flying his PT-19 with a Walt Good dual-proportional on it—and he mentioned that he was using nothing less than a Fox 59 for power! Jetco have also detailed another multi-channel installation on the plans—and it's worth stressing that regardless of the make of R/C you install in your PT-19, be sure to follow the manufacturer's instructions to the letter.

The most remarkable characteristic discovered about low-wingers is that the more power you give them, the easier they are to fly—which is not true with the high-wingers. The original model has a K&B Allyn .29 Torpedo up front, which gives plenty of power when opened up, and on low speeds it idles down so that the model doesn't budge an inch even on the smoothest runway. Johnny Brodbeck of K&B Allyn gave me the tip to add one or two extra head gaskets in order to LOWER the compression ratio. While this may cut the peak r.p.m. slightly, it creates a higher cylinder temperature and less resistance on the up stroke, thereby making the Torp exceptionally smooth and reliable at idling speed. The Torp. .29 is fitted radially on the original model, and photos and sketches show the installation on the plans. The one drawback to inverted engines has been due to the difficulty of drawing fuel into the crankcase. With the choke installation for the Torp. 29 shown on the plan, all starting troubles are non-existent. Bolt an adapter plate to the Torp. and mount engine to firewall at the specified thrust angles. Solder a stranded wire from the top of the glow-plug to the hi-speed needle valve. In this way a complete circuit for starting is had by connecting the booster battery to the hi-speed valve and to the exhaust extension. With the introduction of the new K&B Allyn Torp. .35 R.C., I worked out a new beam mounted installation for this engine—and this engine is now the standard power unit for the kit version of the PT-19, being shown on the fuselage drawings and with bearer holes in the die-cut formers positioned accordingly.

The Perfect fuel tank #13 shown on the plans will work very well for all flying except inverted flight and outside loops. Two Jim Walker pressure tanks were used originally on the prototype, but this system proved quite touchy as regards the 2-speed adjustment and location of the Walker fuel regulator.

Before you reach for the cement, let's give a few more details about this scale design. First of all, there is the steerable tail-wheel which enables you to taxi out to any desired spot, take off, and upon landing with power on, taxi right back to the starting place. Believe me, this is just as exciting as flying and really impresses spectators and modelers alike. The two open cockpits plus removable hatch allow unequaled accessibility, since everything from the escapement, elevator servo, batteries, switch, receiver, fuel tanks, and motor control unit are within easy reach.

Note the extra long nose—this is a life saver for you fellows who always have to add lead to the front end of your R/C jobs. Here's one model that won't require this as there's plenty of leeway for shifting the batteries and/or receiver till she balances.

The fuselage construction of the prototype lends itself to a light but sturdy structure, and as a result the model weighs only six pounds ready to fly with a Babcock 3-channel receiver installed. The PT-19 would also make an excellent flyer with single channel equipment, as a free-flighter, or even U-control scale. Whichever type of model you build, the PT-19 will certainly be a standout not only in appearance, but will fly with the best of the "boxes". I should like to thank Pete Bowers for the loan of his photos of the real PT-19, from which were copied authentic details and markings. Bruce Becker worked with me on the flight shots of the original model, and Washington Skyways of Ephrata, Washington, helped by loaning their copy of their Army Training Order Handbook on the PT-19.

Construction Notes

Use the hardest (match carefully) 5/16" sq. for the longerons, using wide rubber bands to assist in holding the built-up sides together during assembly. Use a casein glue for installing the plywood firewall, bearers and other hardwood parts. Start the fuselage planking at the nose, preferably covering the sides first.

Note the built-in engine dow- sidethrust—also the offset fin and rudder. The tail surfaces are f: models, but Dick Paul built his PT-19 with the fin joined to the stab, but with the assembly detachable from the fuselage—and being secured for flight by passing a 1/8" dowel through 1/8" plywood set in the fuselage sides and 1/8" plyons at this point). For transportation ease, you may wish to follow this procedure for your own model.

It is important that the tailwheel wire shows no binding tendency within the brass tube, so that the tailwheel pivots easily.

After reading of the "Blip" system (Aug. 1955 "Young Men", page 12) of motor speed change, I decided to give it a try without reworking the arms of the Bonner compound. Subsequent bench tests, however, indicated that if the contact was set up too close to neutral it was difficult to make a quick enough blip, while on the other hand if contact was moved closer to the right rudder spot an unintentional change of speed would come about once in a while when pulsing for left rudder. Since 100% operation on the bench is a requisite of mine, it was decided to return to the original three-beep system that worked faultlessly in my Cub J-3. Future flight tests indicated the desirability of more rudder movement. Rather than impose an additional load on the escapement by bending the wire rudder arm further away from the torque rod, I reworked the escapement arms to the 180 degree type described in the article. This not only gave the required additional movement but allowed the escapement to be spaced further away from the torque rod as well, resulting in more leverage. For those of you that would rather not add any rework, I believe Howard Bonner is manufacturing this revised type. Set up the torque rod and escapement for 1/2" to 5/8" left and right rudder movement from the neutral position. Be sure to set the hardwood escapement mounts slightly off-center to allow clearance for the elevator servo.

The kit model features a conventional balsa cowl—the one on my original model was made of Fiberglass for safety against dents and other damage. It may be duplicated on your model by making up the standard cowl (do not cut front holes), sanding it 1/32" undersize and using this as the mould. Pull a piece of Saran wrap over the face of the block and fasten to the rear face. Apply one layer of cloth and resin and let it set up. Two layers of medium weight fiberglass cloth should bring it up to the right thickness. Smooth with a wood rasp and wet or dry paper. Pull loose from block pattern and slip over the firewall. Sand the fuselage planking to match the cowl. For the benefit of those who have been wary of fiberglass, it's much easier than it sounds.

When the time comes to install the elevator link-up (after the stab has been attached to the fuselage), add the hinges and join the elevators to the stab, then connect up the 3/16" dia. dowel pushrod to the elevator servo and the brass tube elevator horn. The elevator horn as shown and used in conjunction with a Babcock "trimmable" elev. servo will give 12-1/2 degrees up and down movement which has proven to be just right for the PT. As an extra precaution for those of you that have never flown with elevator control before, I would recommend that a metal tab be soldered to the "down" stop in the servo limiting it to 3-4 degrees down for the first few flights.

The four spar stub boxes are made up using the balsa strip stubs provided as cores around which each set of four strips of 1/16" plywood is joined with casein glue and then carefully wrapped with thread as shown on the plans. Be sure to push the cores out before the glue sets. The standard dihedral (or plans) is 6-7/8" (11 degrees) under each tip rib (80) for R/C or free flight versions. For a controline version, reduce to 4-5/8" (7-1/2 degrees) scale dihedral. After each wing panel has been completed, with the spar stub boxes installed, use a hacksaw blade to cut through the leading edges, trailing edges, spars and spar boxes.

The "torsion bar" type of landing gear has proven to be an excellent shock absorber. Do not run the antenna any closer to the landing gear than as shown on the plan. The two wing fairings are cut from 1/32" sheet, two thicknesses being used for each one. Cement each lamination together and, while the cement is still wet, curve to the concave shape and pin between the fuselage and wing junction. Fill in the area forward of the fairing pattern with soft scrap balsa and sand to shape. Cover with 1/16" sheet or fill in with scrap underneath each fairing!

Covering Notes

Before covering the model carefully go over the complete structure with sandpaper to remove all rough spots. The original model's wing and fuselage are silk covered, with Silkspan being used on the tail surfaces for lightness. If you want a really rugged model, I suggest you cover entirely with silk (including tail surfaces). Apply one thin coat of clear dope over all the balsa surfaces in which the wet covering will come in contact. Cut silk to the required shapes (slightly oversize), wet and use a mixture of fuel-proof dope with 10% fuel-proof cement added as the adhesive. Brush on two coats of clear dope over the complete model. Two more coats, (preferably sprayed) of Aero Gloss balsa filler coat, sanding between coats will give an excellent base for the colored dope.

At least four coats of yellow will be required and should be applied first. Two to three coats of Army Blue will give a good finish. Of course, this is the "minimum" finish for a neat appearing model and can be doubled or tripled for one of those "super" finishes. The decals provided are those in use just prior to W/W 2. As there are plenty of PT-19's and PT-26's flying around these days with civilian colors, schemes and markings, you may prefer to decorate your model in this way, for a more individual appearance. Canadian or R.A.F. markings are another alternative of course.

The wing walks are cut from wet or dry carborundum paper. Adhere to wing with casein glue. As for the dummy shock absorbers, they must be free to move with the wire gear, so I have been sticking them to the underside of the wing with rubber cement which allows them to flex on hard landings. A better method might be to insert a piece of 1/8" thick foam rubber between the shock absorbers and the wing (joining to both with contact cement).

The wing is scaled exactly, even to having the identical airfoil section (NACA 2416 tapering out to NACA 4409 at the tips)—and the kit method of building the wings automatically incorporates tip washout—which undoubtedly contributes to the smooth flight characteristics of our model.

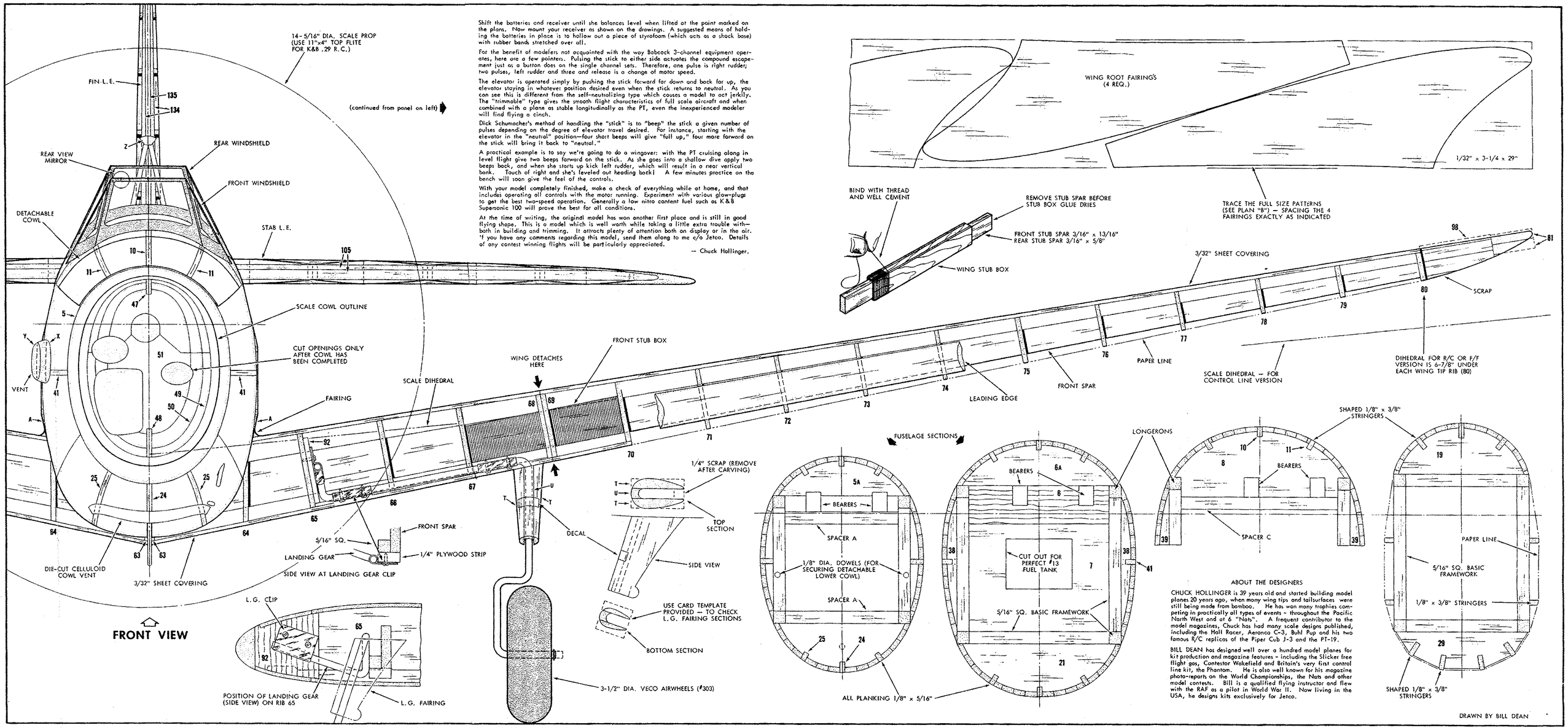
Flying Notes

Ascertain that the balsa wing stubs are a firm press fit in the boxes and make a set with 4 degrees additional angle for the model's first flights. After you have had plenty of precision flying and feel like "wringing her out" make up a set of stubs from 1/8" hard balsa and face with 1/16" ply (or 3/32" soft pine faced with 3/32" hard balsa) for additional strength. In addition to the outboard panels being a press fit, use a strip of masking tape over the wing joint. This also acts as an air seal.

The Babcock Mk. II compound escapement has proven to be ideal for large R/C ships like the PT-19. It not only handles fully wound 1/4" brown rubber but the thicker English "Dunlop" rubber as well! This combination is a "must" for the PT's large rudder and steerable tail wheel. Follow the installation sketch on the plans. The Babcock motor control unit has been used with complete success on the prototype and is the simplest and most reliable type so far devised.

Once the model is completed and still minus receiver and batteries, pick it up by the top longerons and see how she balances. The required balance point depends upon several factors. First of all, the C G. as shown on the plans will give extremely smooth longitudinal stability as required for control line and elevator controlled R/C. If your PT-19 is to be flown F/F or rudder-only R/C, balance it 1/2" behind the spot shown. A K&B Allyn Torp. '9 will provide more than power enough for F/F, in which case only 3 degrees right thrust should be used. With a fairly lightweight model, even a Torp. .15 should prove sufficient F/F.

(continued in panel, top right)



Shift the batteries and receiver until she balances level when lifted at the point marked on the plans. Now mount your receiver as shown on the drawings. A suggested means of holding the batteries in place is to hollow out a piece of styrofoam (which acts as a shock base) with rubber bands stretched over all.

For the benefit of modelers not acquainted with the way Babcock 3-channel equipment operates, here are a few pointers. Pulsing the stick to either side actuates the compound escapement just as a button does on the single channel sets. Therefore, one pulse is right rudder; two pulses, left rudder and three and release is a change of motor speed.

The elevator is operated simply by pushing the stick forward for down and back for up, the elevator staying in whatever position desired even when the stick returns to neutral. As you can see this is different from the self-neutralizing type which causes a model to act jerkily. The "trimmable" type gives the smooth flight characteristics of full scale aircraft and when combined with a plane as stable longitudinally as the PT, even the inexperienced modeler will find flying a cinch.

Dick Schumacher's method of handling the "stick" is to "beep" the stick a given number of pulses depending on the degree of elevator travel desired. For instance, starting with the elevator in the "neutral" position—four short beeps will give "full up," four more forward on the stick will bring it back to "neutral."

A practical example is to say we're going to do a wingover: with the PT cruising along in level flight give two beeps forward on the stick. As she goes into a shallow dive apply two beeps back, and when she starts up kick left rudder, which will result in a near vertical bank. Touch of right and she's leveled out heading back! A few minutes practice on the bench will soon give the feel of the controls.

With your model completely finished, make a check of everything while at home, and that includes operating all controls with the motor running. Experiment with various glow-plugs to get the best two-speed operation. Generally a low nitro content fuel such as K&B Supersonic 100 will prove the best for all conditions.

At the time of writing, the original model has won another first place and is still in good flying shape. This is a model which is well worth while taking a little extra trouble with—both in building and trimming. It attracts plenty of attention both on display or in the air. If you have any comments regarding this model, send them along to me c/o Jetco. Details of any contest winning flights will be particularly appreciated.

— Chuck Hollinger.

ABOUT THE DESIGNERS

CHUCK HOLLINGER is 39 years old and started building model planes 20 years ago, when many wing tips and tailsurfaces were still being made from bamboo. He has won many trophies competing in practically all types of events - throughout the Pacific North West and at 6 "Nats". A frequent contributor to the model magazines, Chuck has had many scale designs published, including the Hall Racer, Aeronca C-3, Buhl Pup and his two famous R/C replicas of the Piper Cub J-3 and the PT-19.

BILL DEAN has designed well over a hundred model planes for kit production and magazine features - including the Slicker free flight gas, Contestor Wakefield and Britain's very first control line kit, the Phantom. He is also well known for his magazine photo-reports on the World Championships, the Nats and other model contests. Bill is a qualified flying instructor and flew with the RAF as a pilot in World War II. Now living in the USA, he designs kits exclusively for Jetco.

DRAWN BY BILL DEAN

Aileron Installation – CG RT-8

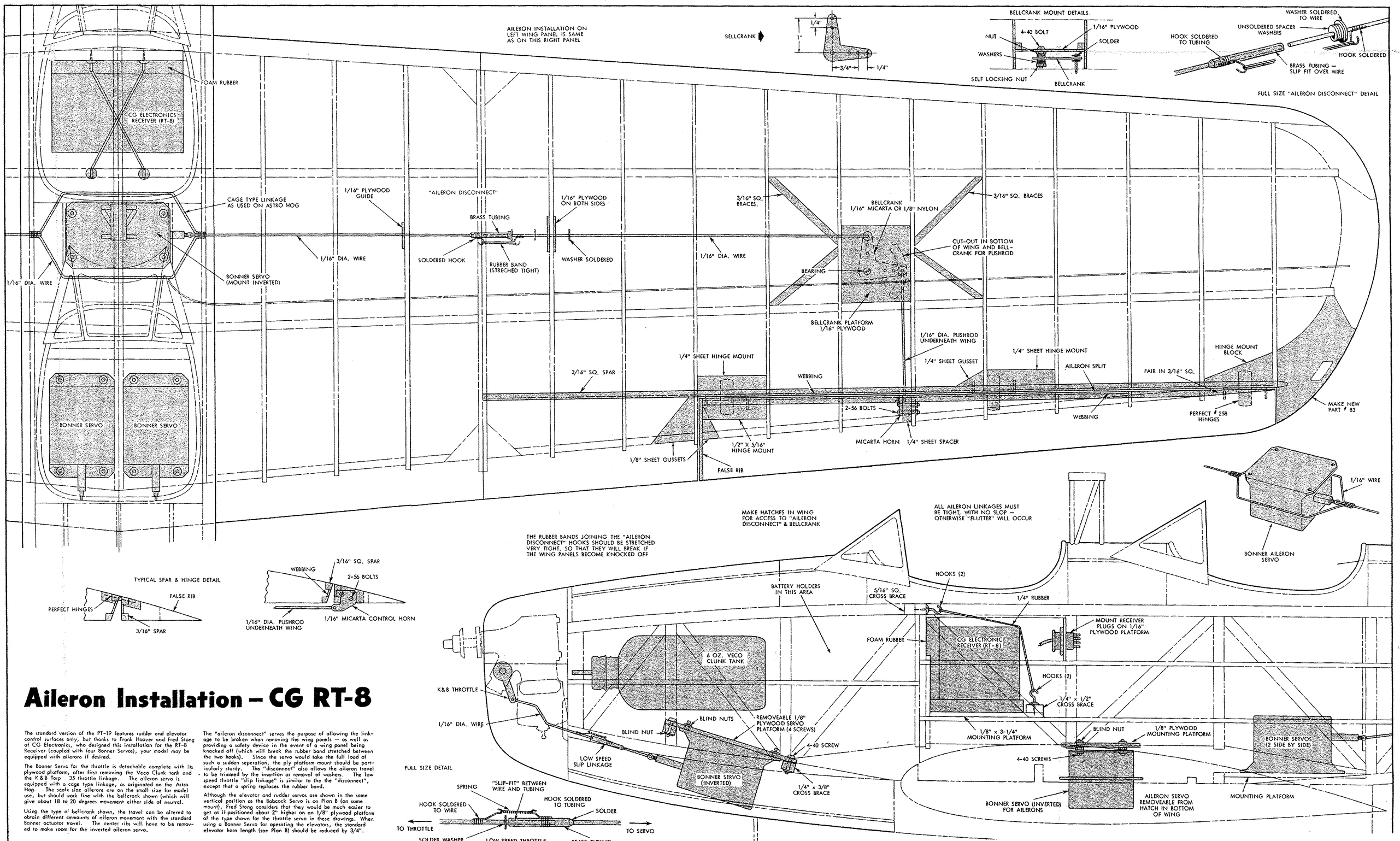
The standard version of the PT-19 features rudder and elevator control surfaces only, but thanks to Frank Hoover and Fred Stang of CG Electronics, who designed this installation for the RT-8 Receiver (coupled with four Bonner Servos), your model may be equipped with ailerons if desired.

The Bonner Servo for the throttle is detachable complete with its plywood platform, after first removing the Veco Clunk tank and the K & B Torp .35 throttle linkage. The aileron servo is equipped with a cage type linkage, as originated on the Astro Hog. The scale size ailerons are on the small size for model use, but should work fine with the bellcrank shown (which will give about 18 to 20 degrees movement either side of neutral.

Using the type of bellcrank shown, the travel can be altered to obtain different ammounts of aileron movement with the standard Bonner actuator travel. The center ribs will have to be removed to make room for the inverted aileron servo.

The "aileron disconnect" serves the purpose of allowing the linkage to be broken when removing the wing panels — as well as providing a safety device in the event of a wing panel being knocked off (which will break the rubber band stretched between the two hooks). Since the servo would take the full load of such a sudden seperation, the ply platform mount should be particularly sturdy. The "disconnect" also allows the aileron travel to be trimmed by the insertion or removal of washers. The low speed throttle "slip linkage" is similar to the the "disconnect", except that a spring replaces the rubber band.

Although the elevator and rudder servos are shown in the same vertical position as the Babcock Servo is on Plan B (on same mount), Fred Stang considers that they would be much easier to get at if positioned about 2" higher on an 1/8" plywood platform of the type shown for the throttle servo in these drawings. When using a Bonner Servo for operating the elevators, the standard elevator horn length (see Plan B) should be reduced by 3/4".



TYPICAL SPAR & HINGE DETAIL

MAKE HATCHES IN WING FOR ACCESS TO "AILERON DISCONNECT" & BELLCRANK

ALL AILERON LINKAGES MUST BE TIGHT, WITH NO SLOP — OTHERWISE "FLUTTER" WILL OCCUR

THE RUBBER BANDS JOINING THE "AILERON DISCONNECT" HOOKS SHOULD BE STRETCHED VERY TIGHT, SO THAT THEY WILL BREAK IF THE WING PANELS BECOME KNOCKED OFF

FULL SIZE DETAIL

Original model fitted with K&B Torpedo .29, two Walker pressure tanks and Fibreglass cowl

Civilian PT-26 is one of many such planes still flying

Wartime factory line-up of PT-19's ready for delivery to USAF

Color scheme of kit model follows pre-war U.S. Army style

K&B Allyn Torpedo .29 radial installation on the original model

Access to BCR-4A Receiver is via front cockpit

Chuck Hollinger's PT-19 was originally published in 'American Modeler' magazine (then 'Young Men'). Our thanks go to Editor Al Lewis for his cooperation and permission for this Jetco kit version to be manufactured.

PLANS BY BILL DEAN, CHUCK HOLLINGER AND CAL SMITH

Chuck's replica of PT-19 in flight

FIN & RUDDER ARE BUILT FLAT OVER PLAN

RUDDER & ELEVATOR HINGE DETAIL

.033 DIA. WIRE

1/16" I/DIA. BRASS TUBE (FLATTENED)

HINGE

RUDDER DECAL

SCALE ALUM. TRIM TAB

O TO S

FAIRING W

HINGE

.042 DIA.

.049 DIA. WIRE

WASHERS

DECAL

.042 DIA. WIRE

1/16" I/DIA. BRASS TUBE

FORMED TAILWHEEL WIRE

1-1/8" DIA. VECO BALLOON WHEEL (#309)

STEERABLE TAIL WHEEL

TOP

BOTTOM

FRONT

FAIRING SECTIONS

SLOT SIDE STRINGERS BEFORE INSTALLING

IF ANY PARTS "STICK", LIGHTLY SAND THE BACK OF THE DIE-CUT SHEET AND THEY WILL THEN COME OUT CLEANLY

LONGERONS

SPACERS

FUSELAGE REAR TOP VIEW

AFTER FINISHING MODEL WITH AERO GLOSS FUEL PROOF DOPE, APPLY DECALS IN POSITIONS INDICATED. WHEN DECALS ARE QUITE DRY, APPLY CLEAR VARNISH OVER THEM (OVERLAPPING EDGES BY 1/16"). FOR EXTRA PROTECTION FROM FUEL, APPLY A COAT OF WAX OVER ALL DECALS

SLOT FOR STAB

SCALE CONTROL ROD FAIRING

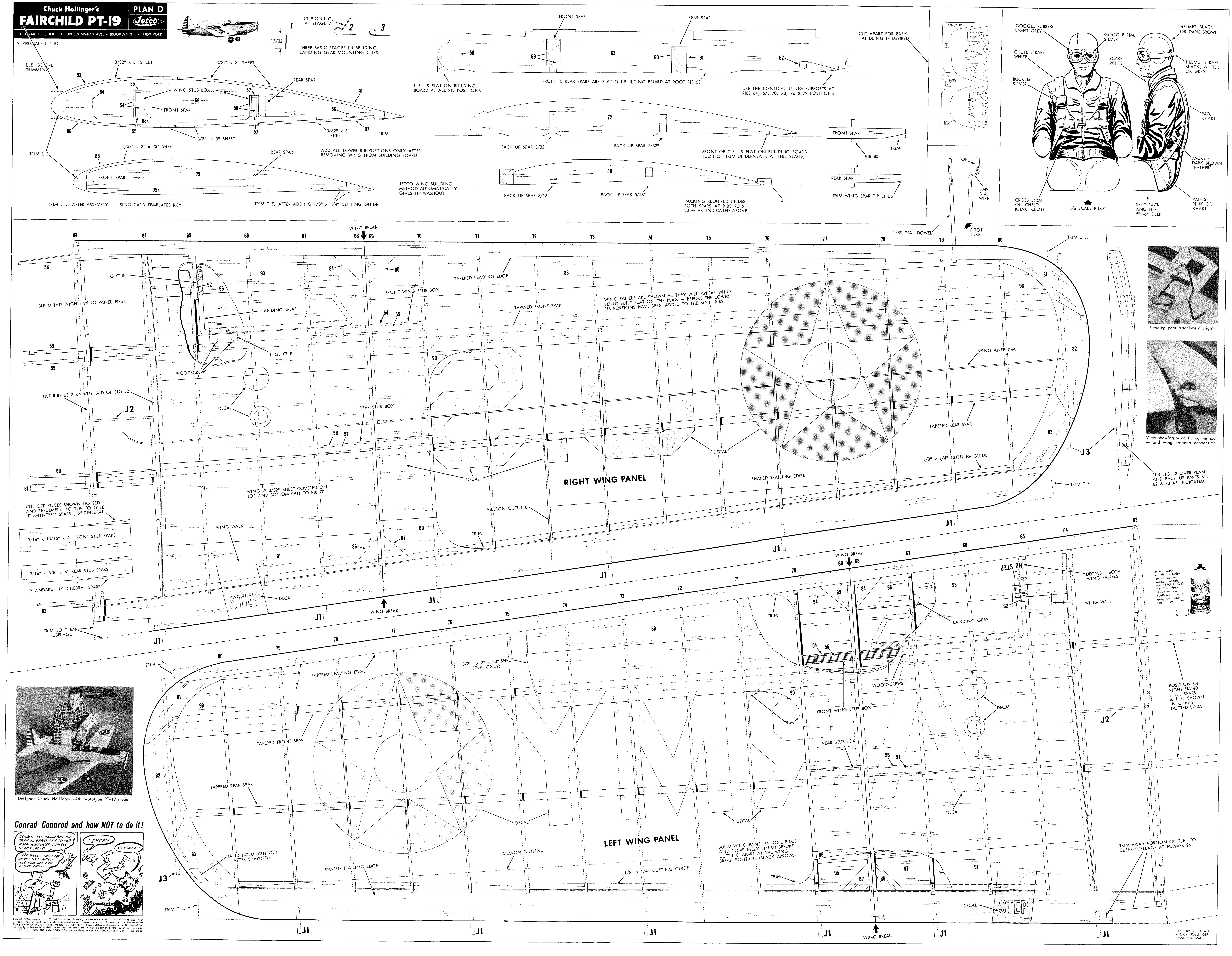
1° RIGHT RUDDER OFFSET

TYPICAL RUDDER SECTION

.042 DIA. WIRE

JOIN AT "XX"

X



Landing gear attachment (right)

View showing wing fixing method — and wing antenna connection

Designer Chuck Hollinger with prototype PT-19 model

Chuck Hollinger's FAIRCHILD PT-19

PLAN C

Jetco Models

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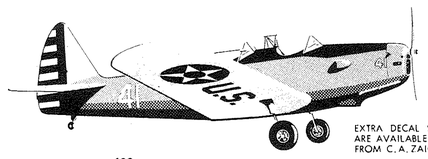
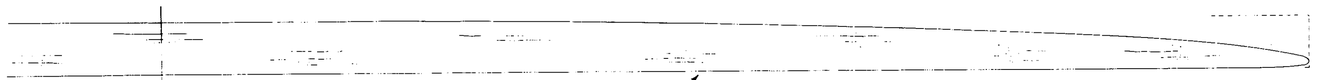
SUPERSCALE KIT RC-1

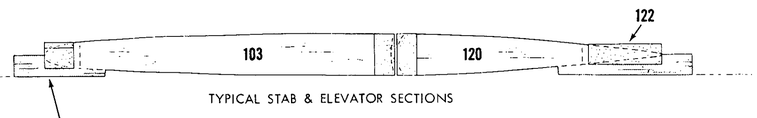


EXTRA DECAL SHEETS (6) ARE AVAILABLE FOR $3.00 FROM C. A. ZAIC CO. INC.



CUT STAB SPAR FROM 1/4" x 5/8"

Fairchild PT-19 spans 36', has top speed of 150 m.p.h. and lands at 50 m.p.h.



TYPICAL STAB & ELEVATOR SECTIONS

BUILDING SUPPORTS ENABLE TAILSURFACES TO BE BUILT FLAT OVER PLANS

TRIM ENDS OF RIBS AS REQUIRED

TRIM OFF SUPPORTS AFTER COMPLETING STAB ASSEMBLY

"TACK CEMENT" STAB TO ELEVATORS & SHAPE AS UNIT, THEN SEPERATE

STABILIZER

1/16" x 3" SHEET

HINGE

HINGE

TRIM ENDS OF RIBS AS REQUIRED

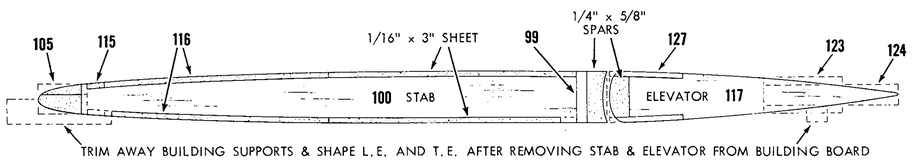
HINGE (SAME AS ON RUDDER)

ALL TAILSURFACE PARTS ARE DIE-CUT EXCEPT FOR THE SPARS (SEE PATTERNS)

SOLDER WASHERS TO TUBE

3/32" DIA. BRASS TUBE

FLATTEN END AND DRILL .042 DIA. HOLE IN ELEVATOR HORN.



TRIM AWAY BUILDING SUPPORTS & SHAPE L.E. AND T.E. AFTER REMOVING STAB & ELEVATOR FROM BUILDING BOARD

TRIM

TOP VIEW

FRONT VIEW

CUT ELEVATOR SPARS FROM 1/4" x 5/8"

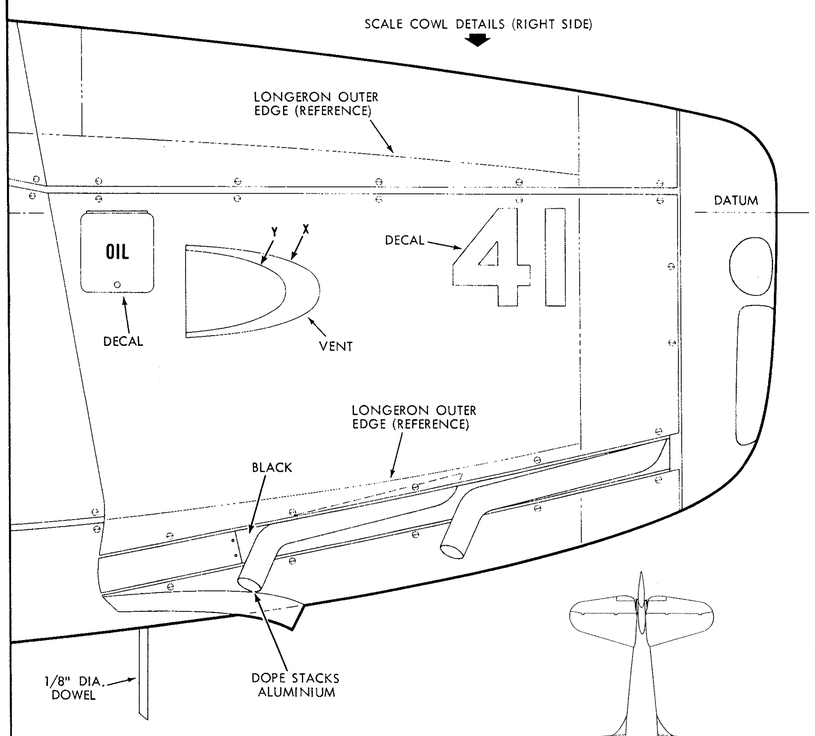
TAPER SPARS BEFORE STARTING ASSEMBLY

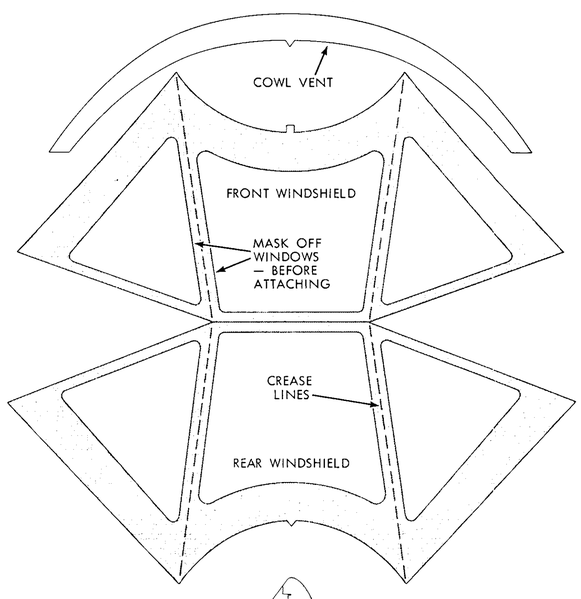
SUPERSONIC "100"
1/2 Pint . . . 50c
Pint 85c
Quart $1.50
Gallon . . . $5.50

SUPERSONIC "1000"
1/2 Pint . . . 60c
Pint $1.00

IF YOUR WORKBENCH SPACE IS SMALL, THE PLANS MAY BE CUT APART ALONG DOTTED LINES — FOR EASY HANDLING

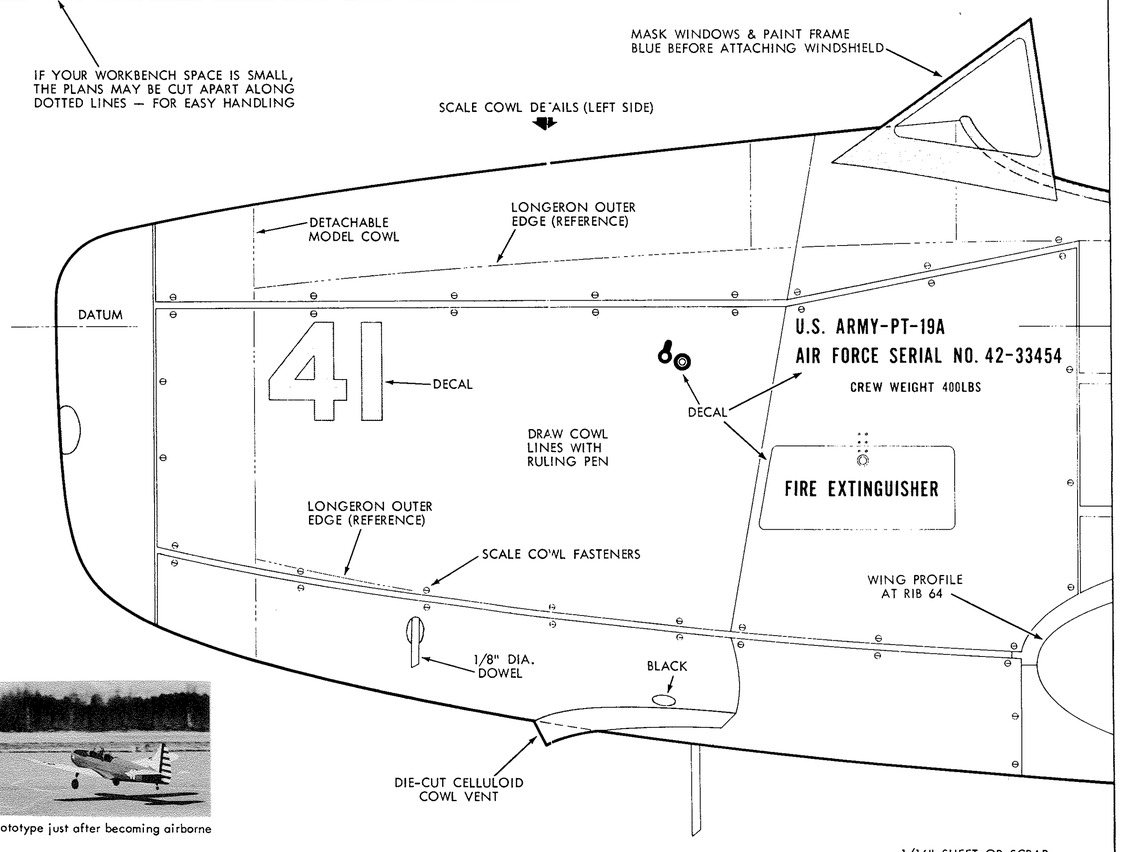
SCALE COWL DETAILS (RIGHT SIDE)

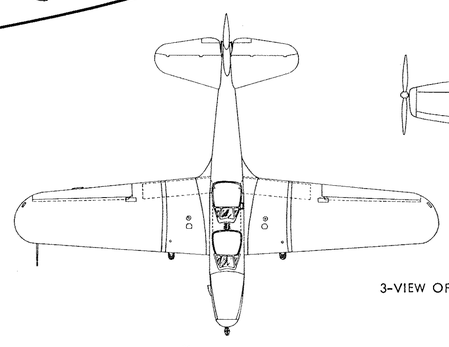




SCALE COWL DE'AILS (LEFT SIDE)

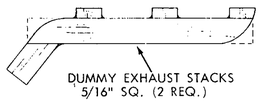
MASK WINDOWS & PAINT FRAME BLUE BEFORE ATTACHING WINDSHIELD





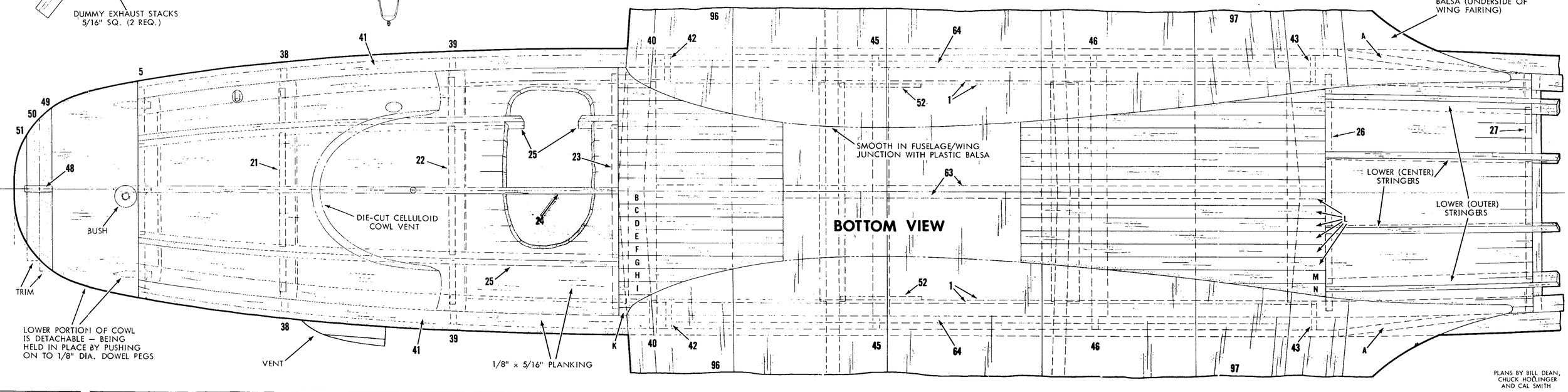
3-VIEW OF PT-19

Prototype just after becoming airborne



DUMMY EXHAUST STACKS 5/16" SQ. (2 REQ.)

1/16" SHEET OR SCRAP BALSA (UNDERSIDE OF WING FAIRING)



PLANS BY BILL DEAN, CHUCK HOLLINGER AND CAL SMITH