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TRAVEL AIR "2000"

By BILL NORTHROP . . . BY POPULAR DEMAND IS BEST WAY TO DESCRIBE WHY WE'RE PUBLISHING THE TRAVEL AIR. GRID LEAKS COVER PIC CREATED INTEREST.

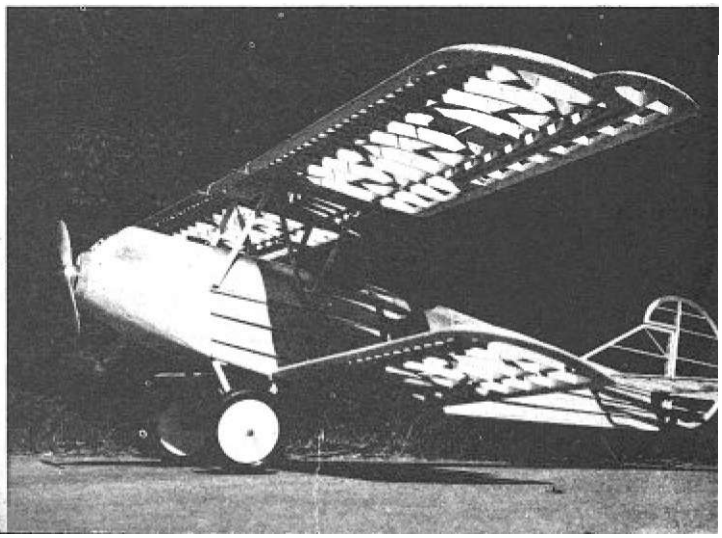
• For the information of those of you who may net know, the author is a confirmed, incurable, biplane addict. The addiction has recently become strong enough to require a "fix" at least once a year.

Complete relief comes only in the form of designing, constructing, and flying some sort of two-winged R/O airplane. A scale ship has a longer lasting effect than an original design.

The Travel Air 2000 is a thorough and long lasting treatment, requiring no deviations or additions to the original formula. It has generous horizontal tail area, a decent nose moment, enough (*Continued on next page*)

The "addict" and the "fix." First time we have ever seen him sitting at his work and wonder if the big bird reversed the wringing out procedure.

Complete framework sans covering. Note, similarity to Fokker D-VIII plus the very mony bits and pieces that go into making his Scale bird.



Aft view shows that aileron control struts and brace wires have been left out for regular day-to-day flying. Note ample rudder and elevator area.

TRAVEL AIR . . . continued

dihedral for multi control, and best of all, an in-line engine configuration (Curtiss OX-5).

There are only two problem areas, neither of which is insurmountable, but nevertheless existent. Since ailerons are in the top wing only, the operating servo must either be mounted in the top wing center section for conventional connection, or in the bottom wing, which requires more complicated though scale-like linkage. The second problem results from the location of the rear landing gear strut. It coincides with the position of the lower wing front spar.

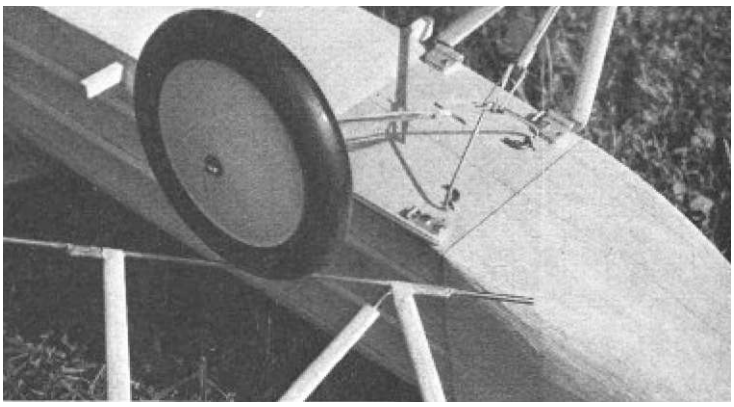
Our model was constructed with plug-in bottom wings, which took care of the landing gear problem and necessitated the simpler alternative in regard to the ailerons. However, this created a third problem. The outerplane struts became functional, which meant that you couldn't hardly do without them. It also meant very precise fitting and alignment of the plywood "tubes" to receive the plugs.

The plans show a revised lower wing which can be built in one piece. Although it is locked in place on the fuselage, it won't suffer any more than the plug-in type in the event of a ground loop or cartwheel. A possible bonus to this arrangement is that the aileron servo may be mounted in the lower wing, which would allow the modeler the dubious pleasure of employing the aileron control strut in prototype fashion. If mounted in the top wing, an "extension" cord must be rigged from the servo, down a cabane strut, and through the front cockpit to the receiver output connector.

Liberties were taken in two areas of scale reproduction. One we felt necessary, the other was for aesthetic reasons only, and could easily be dismissed. The airfoil thickness has been increased over the scale 3/4" depth which is not much to work with when you realize the model's wings will be cantilever construction, having no help from landing and flying wires. There's also the problem of squeezing in a servo. The second liberty was the 1/2" of dihedral in the top wing panels. For some reason, a straight wing on a model always appears to be sagging, particularly when there's another wing underneath that's tilting up toward it. The top wing is supposed to be straight, and unless you sight down the leading edge, the slight dihedral is not evident. If you're planning to enter scale competition and fear loss of points, go ahead and build it flat. It won't affect the flying ability, but like we said—yeuch!

Speaking of scale competition, the most consistent complaint from scale fidelity judges is the lack of information in the way of full size dimensions and the *scale ratio* of the model presented. As Milt Sheppard, chief scale judge at this year's Nats pointed out, no one, judge or no judge, could possibly know the dimen- (*Continued on page* 40)

Yog! is completing more dual training after clobbering Big John. Haven't heard details but am sure it would be good reading if we pressed him.



Close-up to clarify landing gear detail and shock arrangement. Fittings are simple and made quite easily by use of hand tools and sheet metal .

On the taxi strip at Summit Aviation owned by Kip du Pont, newcomer to RC and the son of the famous glider-pilot. Looks almost real on tarmac.

Travel Air

(Continued from page 28)

sions of every airplane ever built. Furthermore, given a dimensioned drawing of the full size craft, why should the judge have to figure out what scale the model is in order to check it out?

(Incidentally, Free Flight Contest Board, your scale judge's sheet has no scoring slot for scale presentation, the heart of the whole matter!)

The Travel-Air "2000" presented herein was scaled from Joe Nieto drawings published in the Feb. 1953 issue of M.A.N. Luckily, full size prints of the original Nieto drawings of this and many other planes are available through the Smithsonian Institution. Many of these, as with the Travel Air, consist of two 23 x 31 sheets, and the scale *is 3/4"* = 1 ft. Each sheet costs a dollar; therefore, the Travel Air is $2.00, which includes cost of mailing tube and postage. A complete list of drawings available may be had from the Institution by writing to: Fiscal Division, Section M, Smithsonian Institution, Washington, D. C. 20560.

A little bit of history on this plane sounds like pilots' lounge namedropping. The Travel Air Company was formed in 1925 in Wichita, Kansas, by a group of business men, including Clyde Cessna, and Walter Beech. The first plane was produced under the guidance of Lloyd Stearman and Mac Short. The latter became a leading engineering executive with Lockheed. As for Cessna, Beech, and Stearman, if you haven't heard of them, you're probably not reading this anyway.

The plane was designed as a three-sealer (two passengers in front, pilot in rear) and was powered by the abundantly available Curtiss OX-5, 90 hp engine used in

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Jennies, Standards and other planes of the mid 1920 era. Top speed was 100 mph, landing speed 40 mph, and cruising range was 500 miles.

Travel Air was one of the first to use welded steel tubing in the basic fuselage construction and pioneered the split axle landing gear.

The 2000 model won the Ford Reliability Tour in 1925 and 1926, which brought it fame and popularity. A total of 530 planes were built in 1928 alone.

Because of its similarity to the Fokker D VIII (particularly the aerodynamically balanced rudder and "elephant ear" ailerons), the Travel Air 2000 and 3000 (Hispano 150 hp) were employed in filming the Howard Hughes aviation classic "Hell's Angels." Painted to match the wartime D-VII's, it could fool almost anyone. From this, the 2000 and 3000 models became known as the "Wichita Fokker."

The plane is now a prime target for antique buffs, since it so completely represents the orthodox open cockpit biplane of the leather jacket, scarf, helmet and goggles era of the barnstorming 1920's.

Travel Air

CONSTRUCTION

The writer is not trying to put himself on a pedestal, but it must be pointed out that this model should not only be avoided by beginners in model building, but should also be examined carefully by those whose modeling experience has been limited to "assembling" die cut kits.

It's not so much a difficult model to build as it is painstaking. The roughest areas are the cabane and landing gear wire bending, and the nose sculpturing.

Our building method is to tackle the easiest and dull parts first and progress to the more difficult and challenging areas later. This pattern helps increase your interest as work proceeds and also gets you sufficiently committed so that the job gets finished.

The tail section is of very simple construction, and must be kept as light as possible while maintaining strength. The writer would not even feel adverse to using Silkspan covering on these surfaces.

The moveable parts are attached with Tatone hinges, which are simple and neat, and in no way detract from the scale appearance.

Since sheeting is not allowed on the wings, (Well, we *are* building a scale model, aren't we?) the structure was designed along the pattern of Walt Good's various Bug models.

Spars are built up first, using 1/16" ply joiners at the splice and 3/32" spruce caps as shown. Ri'bs are slipped on and the center section, built first, after which the structure is rocked over to build first one panel, then the other.

The almost imperceptible dihedral (if used) in the top wing begins at the narrow sheeted panel which provides protection from the wing cradle and hold down bands.

Strut fixes are 1/2" wide strips of .005 sheet brass bent over and sweat soldered to 1/2" lengths of 3/32" O.D. brass tube. These are epoxied and pinned (through predrilled holes) in place followed by *1/8"* x 1/4" strips of balsa on each side to facilitate covering.

The basic fuselage is fairly easy to build. It's the finishing touches that get a bit nasty.

Starting with the basic *Va"* sheet sides, 3/32" sheet doublers are added to the inside surface and then strips of *1/8* x *1/4"* and *Va"* sq. are glued to the *outside* edges. A *3/8"* sheet outline goes around the bottom wing opening, also on the outside.

The sides are joined using *1/8"* ply bulkhead F-4, a temporary *1/8"* balsa bulkhead cut to fit the inside section at F-9, and pulling together at the tail post.

The 3/32" x *3/8"* side stringers are tapered to *1/8"* deep at the tail post and to about a *1/4"* at F-4 where they fair into the cowl block. The maximum width of *3/8"* is around F-8 and F-9.

Permanent aluminum Zerox multilith masters were used to cowl in the upper deck from F-9 forward to F-4. Paper patterns were made first and checked for proper fit before cutting out and contact cementing the aluminum sheet TO the bulkheads. The construction is lighter and simpler than balsa planking and covering, but if you don't wish to become a "tin bender," the latter method may be used.

After assembling the engine mounting parts F-1, F-2, F-3, and F-0 (Well, what would you do if you forgot to number the first part and didn't want to erase everything?) to bulkhead F-4, the cowling is built up from balsa block. As we said earlier, this is a difficult area in the construction.

The nose contours were dictated by the V shaped OX-5 and represented one of the best cowling jobs of the era. Three sections, A, B, and the *2 1/2"* nose ring, should help you here. Extra details can be picked up from the Nieto drawings.

The landing gear is sprung exactly as on the original ship. The brass block which provides pivoting at the junction of the main gear and split axle, can be made with a hand drill, hack saw, and file, though a drill press makes things a little easier.

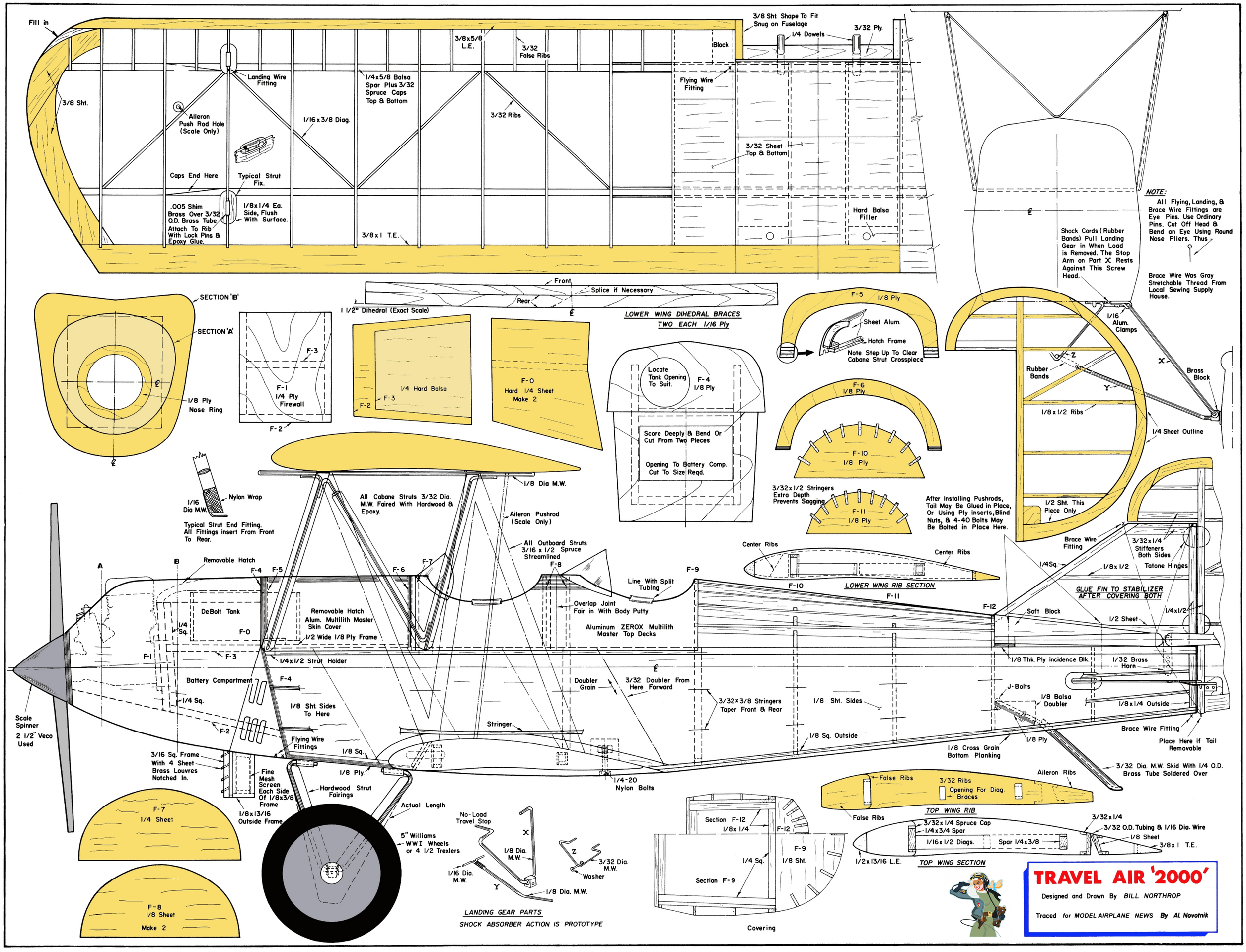
By studying the drawing, it can be seen that the stop arm prevents the gear from being pulled together by the shock rubber bands. Finding the right amount of tension requires some experimentation; Too much and there is no shock action. Too little and the gear will spread-eagle on a hard landing, wiping out the radiator. (Be smart, have the radiator removeable and use only it on official flights.)

We must confess that, until recently, flights on the original model were not too successful. First, we did not have the advantage of the constant trim inherent in proportional equipment. Second, the plane was completed and first flown while the author was still a pretty ragged flier. Third, the plane, because of nylon covering, took buckets of dope to finish and ended up in the 10-pound bracket with only a plain bearing S.T. 45 up front.

No plane could overcome all of these handicaps, and so early flights were erratic and very unscale like.

Recently, using our new 6-meter Quadruplex CL-5. a ball-bearing S.T. .56, zero degrees incidence, and a heck of a lot more experience on the controls, we've had some flights that really show the Travel Air off to its best

Good luck with yours, and remember, think light.


Fill in
3/8 Sht.
Aileron Push Rod Hole (Scale Only)
Landing Wire Fitting
1/16 x 3/8 Diag.
1/4 x 5/8 Balsa Spar Plus 3/32 Spruce Caps Top & Bottom
3/8 x 5/8 L.E.
3/32 False Ribs
3/32 Ribs
Block
3/8 Sht. Shape To Fit Snug on Fuselage
1/4 Dowels
3/32 Ply.
Flying Wire Fitting
3/32 Sheet Top & Bottom
Caps End Here
Typical Strut Fix.
.005 Shim Brass Over 3/32 O.D. Brass Tube Attach To Rib With Lock Pins & Epoxy Glue.
1/8 x 1/4 Ea. Side, Flush With Surface.
3/8 x 1 T.E.
Hard Balsa Filler
NOTE:
All Flying, Landing, & Brace Wire Fittings are Eye Pins. Use Ordinary Pins. Cut Off Head & Bend an Eye Using Round Nose Pliers. Thus
Brace Wire Was Gray Stretchable Thread From Local Sewing Supply House.
Shock Cords (Rubber Bands) Pull Landing Gear in When Load is Removed. The Stop Arm on Part X Rests Against This Screw Head.
1/16 Alum. Clamps
Rubber Bands
Brass Block
1/8 x 1/2 Ribs
1/4 Sheet Outline
1/2 Sht. This Piece Only
SECTION 'B'
SECTION 'A'
1/8 Ply Nose Ring
F-1 1/4 Ply Firewall
F-2
F-3
1/4 Hard Balsa
F-0 Hard 1/4 Sheet Make 2
Front
Rear
Splice if Necessary
1 1/2° Dihedral (Exact Scale)
LOWER WING DIHEDRAL BRACES TWO EACH 1/16 Ply
F-5 1/8 Ply
Sheet Alum.
Hatch Frame
Note Step Up To Clear Cabane Strut Crosspiece
Locate Tank Opening To Suit.
F-4 1/8 Ply
Score Deeply & Bend Or Cut From Two Pieces
Opening To Battery Comp. Cut To Size Reqd.
F-6 1/8 Ply
F-10 1/8 Ply
3/32 x 1/2 Stringers Extra Depth Prevents Sagging
F-11 1/8 Ply
After installing Pushrods, Tail May Be Glued in Place, Or Using Ply inserts, Blind Nuts, & 4-40 Bolts May Be Bolted in Place Here.
1/16 Dia M.W.
Nylon Wrap
Typical Strut End Fitting. All Fittings insert From Front To Rear.
All Cabane Struts 3/32 Dia. M.W. Faired With Hardwood & Epoxy.
1/8 Dia M.W.
Aileron Pushrod (Scale Only)
All Outboard Struts 3/16 x 1/2 Spruce Streamlined
Removable Hatch
DeBolt Tank
1/4 Sq.
F-0
Removable Hatch Alum. Multilith Master Skin Cover
1/2 Wide 1/8 Ply Frame
1/4 x 1/2 Strut Holder
Battery Compartment
1/8 Sht. Sides To Here
Scale Spinner 2 1/2" Veco Used
3/16 Sq. Frame With 4 Sheet Brass Louvres Notched In.
Fine Mesh Screen Each Side Of 1/8 x 3/8 Frame
1/8 x 13/16 Outside Frame
Flying Wire Fittings
1/8 Sq.
1/8 Ply
Hardwood Strut Fairings
Actual Length
5" Williams WW I Wheels or 4 1/2 Trexlers
Line With Split Tubing
Overlap Joint Fair in With Body Putty
Aluminum ZEROX Multilith Master Top Decks
Doubler Grain
3/32 Doubler From Here Forward
Stringer
1/4-20 Nylon Bolts
3/32 x 3/8 Stringers Taper Front & Rear
1/8 Sht. Sides
1/8 Sq. Outside
Center Ribs
LOWER WING RIB SECTION
Brace Wire Fitting
3/32 x 1/4 Stiffeners Both Sides
1/4 Sq.
1/8 x 1/2
Tatone Hinges
GLUE FIN TO STABILIZER AFTER COVERING BOTH
Soft Block
1/2 Sheet
1/4 x 1/2
1/8 Thk. Ply incidence Blk.
1/32 Brass Horn
J-Bolts
1/8 Balsa Doubler
1/8 x 1/4 Outside
Brace Wire Fitting
Place Here if Tail Removable
1/8 Cross Grain Bottom Planking
1/8 Ply
3/32 Dia. M.W. Skid With 1/4 O.D. Brass Tube Soldered Over
Aileron Ribs
False Ribs
3/32 Ribs
Opening For Diag. Braces
TOP WING RIB
3/32 x 1/4 Spruce Cap
1/4 x 3/4 Spar
1/16 x 1/2 Diags.
Spar 1/4 x 3/8
3/32 x 1/4
3/32 O.D. Tubing & 1/16 Dia. Wire
1/8 Sheet
3/8 x 1 T.E.
1/2 x 13/16 L.E.
TOP WING SECTION
F-7 1/4 Sheet
F-8 1/8 Sheet Make 2
No-Load Travel Stop
1/8 Dia. M.W.
1/16 Dia. M.W.
3/32 Dia. M.W.
Washer
LANDING GEAR PARTS
SHOCK ABSORBER ACTION IS PROTOTYPE
Section F-12
1/8 x 1/4
F-12
F-9
1/4 Sq.
1/8 Sht.
Section F-9
Covering
TRAVEL AIR '2000'
Designed and Drawn By BILL NORTHROP
Traced for MODEL AIRPLANE NEWS By Al. Novotnik

TRAVEL AIR 2000 Sheet 2