The All American Rubber Model

In response to those who in the past have whined that I NEVER include a plan in this rag, I'll ruin my bad reputation and present one. It's the All American Model, which was published in the 1952 Air Trails Model Annual, in an article by Robert J. Dunham. The following is the text of the article. Keep in mind, he is talking about things we've long since done differently. Nonetheless, there are some tips in this worth all of us reading.

After competing in three Nationals with cabin models employing a diamond fuselage design, we thought that a change was in order. The main disadvantage of a diamond type fuselage model is found in the mounting of the wing. It is necessary to use a wire birdcage arrangement of a drag-producing , difficult to construct wing platform. To eliminate this it was decided to employ a slab-sided cabin, somewhat resembling a full-scale airplane.

Plans were drawn for a model using the same airfoil, and force arrangement of lifting surfaces, as on the previous diamond fuselage model. The results were most gratifying as dead air flights resulted in times close to three minutes' duration. At the National Meet, the day for this type of model was windy and overcast. Despite this, two out-of-sight flights were made, the model being lost in a field on its last official. Total time of three official flights was 10:23.6. The plane was later found and returned undamaged. While retesting, the ship hooked a slow rising thermal and flew for 50:20, coming down about four miles from the launching point. .

It is still in excellent condition. Due to the plane's simplicity of construction, many of the younger inexperienced fellows in the Tulsa area have built and successfully flown this model. No special tools or materials are needed.

The two fuselage sides are constructed on side view, one over the other, to insure being identical. The four main longerons should be 1/8" square hard balsa, cut from same piece to produce even bending when drawing front and rear together on the top view. The truss-like construction aft of wing results in a strong, lightweight fuselage. The sheet balsa fill-in for the nose, window, landing gear, and rear dowel anchor are then added. Cement a *3/8"* diameter fiber bushing at anchor dowel position. Don't forget wing mount wire or the 3/32" dowel peg to hold rubber band which pulls tail section into the dethermalized position.

The landing gear is of *1/16*" music wire and securely cemented and braced. Wheels are made from 1/8" sheet balsa with balsa hubs cemented cross-grained for strength. Wrap thread or solder brass washers on each side to secure.

An elevator rib template is cut from lightweight aluminum and 10 ribs sliced from quarter-grained sheet balsa. Pin down main spar and tapered trailing edge on plan, cement ribs in, then add square leading edge. The sheet corner gussets keep covering from becoming wrinkled at corners. Next, cover with Japanese tissue, and glue tip rudders to the end stabilizer ribs. Water dope, then clear dope several times. The center rudder and sub-rudder are made of medium hard sheet balsa,

sanded to a symmetrical airfoil and given three coats of clear nitrate.

A wing rib template is fashioned from lightweight aluminum and 21 ribs are cut from quartergrained sheet balsa. Construction procedure is similar to that of elevator. Block up front of trailing edge with scrap sheet to insure a smooth-contoured airfoil. When the three wing panels have been completed, span and leading and trailing edge are fitted by trial and error method, so as to have 5 inches of dihedral in tip panels. The dihedral joints on main balsa spar are reinforced with sheet balsa gussets. Wing tip outlines are from medium soft balsa, with grain as shown. Round off tips and leading edge with sandpaper. Wing is now ready for covering. If Japanese tissue is used for covering, grain of paper should run lengthwise of the wing.

The propeller used on the original model was quite low pitched, which resulted in a fast climb and short motor run of about 50-60 seconds when fully wound — ample to get the model high.

The folding mechanism is self-explanatory and has been used successfully for a number of years. It is strong and durable, resulting in a minimum of maintenance. Other types of folders could be chosen. Both front and rear of prop are reinforced with sheet tin and wrapped with thread.

The nose block is of hard balsa grain running lengthwise. The block is also reinforced wIth tin thrust bearings on both front and back to hold noseblock adjustments.
A compression spring was utilized to engage prop tensioner peg, which extends through back of the nose block. By stopping the propeller at same point each time, the same glide circle is assured on every flight.

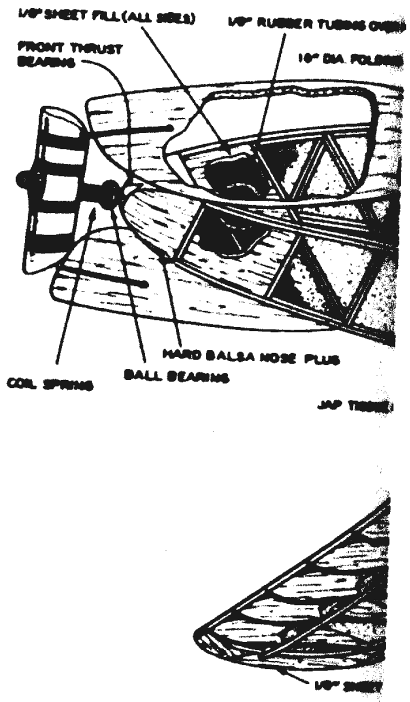
The hinge device on leading edge of elevator has been found to be shear resistant and trouble free. It is constructed of sheet tin with short pieces of brass tubing soldered in place. The hinge pin is about 1” in length, and once engaged, both ends should be coated with glue to prevent its slipping out and allowing tail surfaces to get out of line.

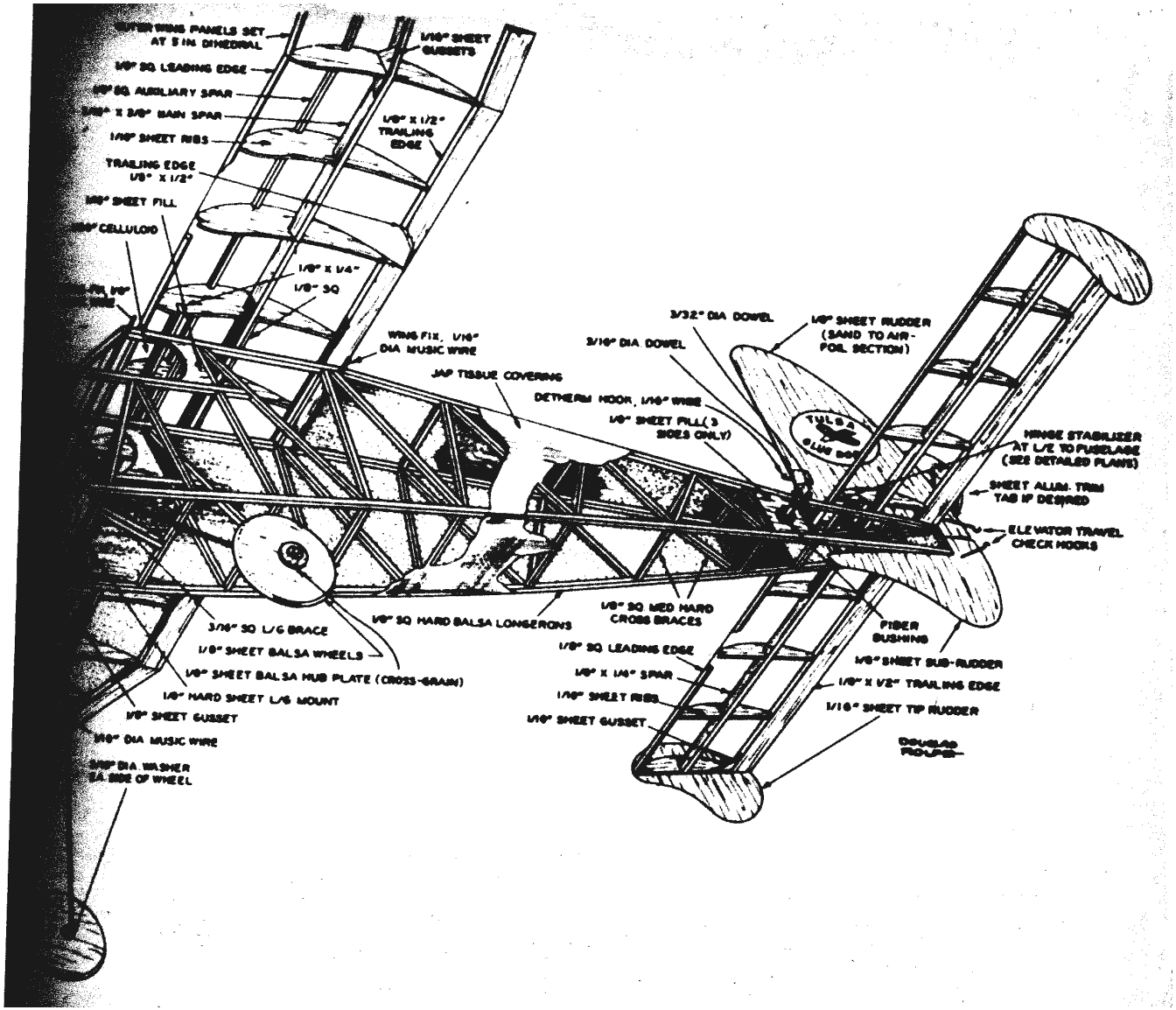
A short length of thread is used to stop the elevator travel at desired angle This angle should be about 30 to 40 degrees for the slowest dethermalized descent. Saltpeter fuse can be purchased already prepared or made by soaking a1/8” diameter cord in a saturated solution of saltpeter. The rate of burning depends on concentration of the solution and flying speed of model.

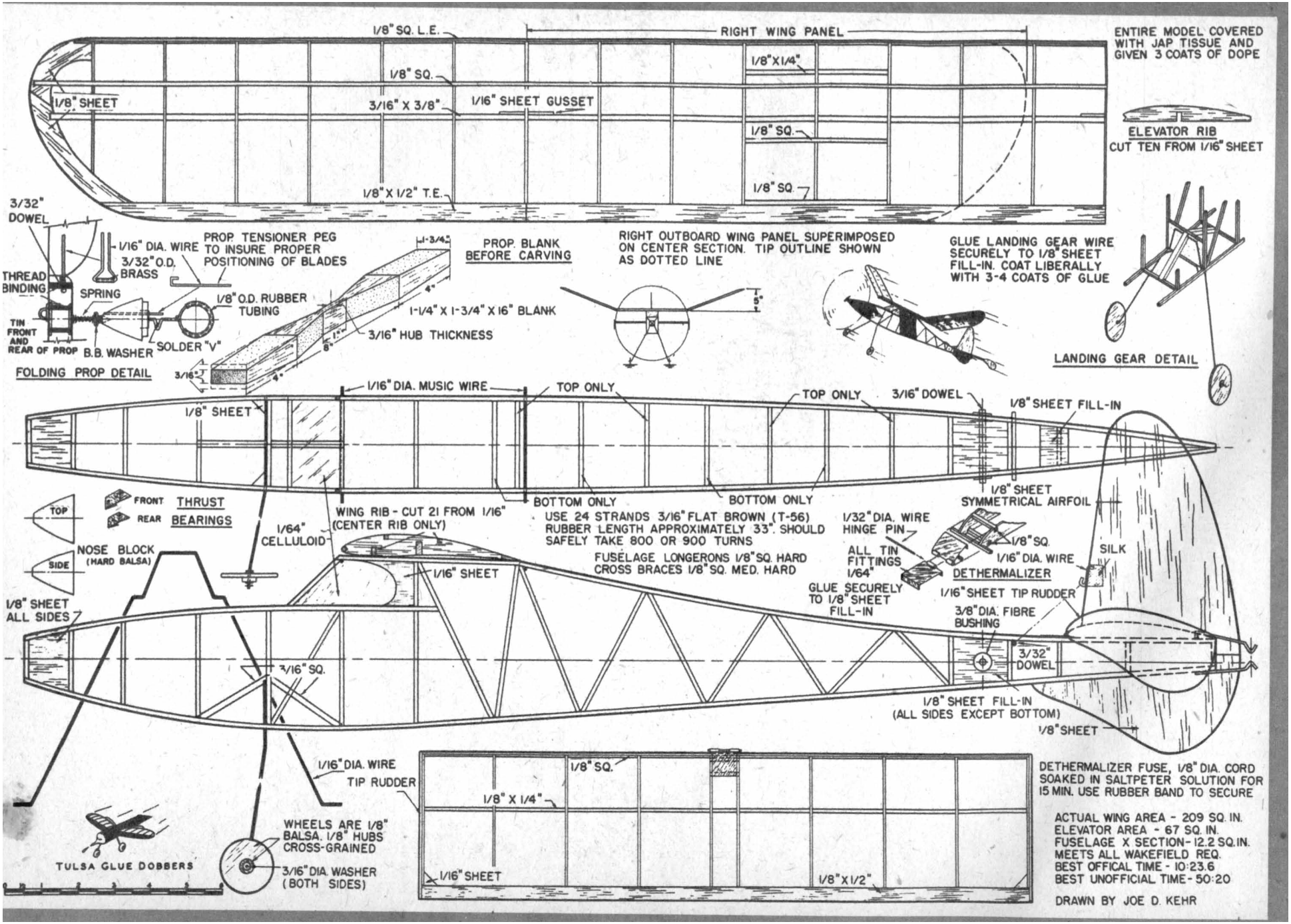
The original model was covered with orange Japanese tissue and given three coats of clear dope. To keep the tissue from becoming brittle with age, add about four drops of castor oil to each four ounces of dope. This mixture also produces a high gloss surface with a minimum of weight.

The completed model weighed 8 ounces and power consisted of 24 strands of 3/16" flat brown (T -56) rubber approximately 33 inches long. The motor should be pre-wound before attempting to apply maximum winds. If windy conditions prevail, an additional 2 to 4 strands of rubber should be used to get plane up and from turbulent ground currents.

The original model climbed into the wind at about a 40 degree angle for on-half of the motor run. It is suggested that the model be test flown during the calm evening hours. First flight should be given about 200 turns, and more turns added as satisfactory flights are made.


1/8" SHEET FILL (ALL SIDES)
1/8" RUBBER TUBING
FRONT THRUST BEARING
10" DIA FOLDING
HARD BALSA NOSE PLUG
BALL BEARING
COIL SPRING
JAP TISSUE


OUTER WING PANELS SET AT 5 IN. DIHEDRAL
1/16" SHEET GUSSETS
1/8" SQ. LEADING EDGE
1/8" SQ. AUXILIARY SPAR
1/8" X 3/8" MAIN SPAR
1/16" SHEET RIBS
1/8" X 1/2" TRAILING EDGE
TRAILING EDGE 1/8" X 1/2"
1/8" SHEET FILL
CELLULOID
1/8" X 1/4"
1/8" SQ
WING FIX, 1/16" DIA MUSIC WIRE
JAP TISSUE COVERING
DETHERM HOOK, 1/16" WIRE
1/8" SHEET FILL (3 SIDES ONLY)
3/32" DIA DOWEL
3/16" DIA DOWEL
1/8" SHEET RUDDER (SAND TO AIR-FOIL SECTION)
TULSA SLING BOW
HINGE STABILIZER AT L/E TO FUSELAGE (SEE DETAILED PLANS)
SHEET ALUM. TRIM TAB IF DESIRED
ELEVATOR TRAVEL CHECK HOOKS
3/16" SQ L/G BRACE
1/8" SHEET BALSA WHEELS
1/8" SHEET BALSA HUB PLATE (CROSS-GRAIN)
1/8" HARD SHEET L/G MOUNT
1/8" SHEET GUSSET
1/16" DIA MUSIC WIRE
1/8" DIA WASHER
1/8" SQ HARD BALSA LONGERONS
1/8" SQ MED HARD CROSS BRACES
1/8" SQ LEADING EDGE
1/8" X 1/4" SPAR
1/16" SHEET RIBS
1/16" SHEET GUSSET
FIBER BUSHING
1/8" SHEET SUB-RUDDER
1/8" X 1/2" TRAILING EDGE
1/16" SHEET TIP RUDDER
DOUGLAS FIR


1/8" SQ. L.E.
RIGHT WING PANEL
ENTIRE MODEL COVERED WITH JAP TISSUE AND GIVEN 3 COATS OF DOPE
1/8" X 1/4"
1/8" SQ.
1/8" SHEET
3/16" X 3/8"
1/16" SHEET GUSSET
1/8" SQ.
ELEVATOR RIB
CUT TEN FROM 1/16" SHEET
1/8" X 1/2" T.E.
1/8" SQ.
3/32" DOWEL
1/16" DIA. WIRE
3/32" O.D. BRASS
PROP. TENSIONER PEG TO INSURE PROPER POSITIONING OF BLADES
THREAD BINDING
SPRING
1/8" O.D. RUBBER TUBING
TIN FRONT AND REAR OF PROP
B.B. WASHER
SOLDER "V"
FOLDING PROP DETAIL
1-3/4"
4"
1-1/4" X 1-3/4" X 16" BLANK
3/16" HUB THICKNESS
1"
8"
3/16"
PROP. BLANK BEFORE CARVING
RIGHT OUTBOARD WING PANEL SUPERIMPOSED ON CENTER SECTION. TIP OUTLINE SHOWN AS DOTTED LINE
5"
GLUE LANDING GEAR WIRE SECURELY TO 1/8" SHEET FILL-IN. COAT LIBERALLY WITH 3-4 COATS OF GLUE
LANDING GEAR DETAIL
1/16" DIA. MUSIC WIRE
TOP ONLY
TOP ONLY
3/16" DOWEL
1/8" SHEET FILL-IN
1/8" SHEET
BOTTOM ONLY
BOTTOM ONLY
1/8" SHEET SYMMETRICAL AIRFOIL
TOP
SIDE
FRONT
REAR
THRUST BEARINGS
NOSE BLOCK (HARD BALSA)
1/64" CELLULOID
WING RIB - CUT 21 FROM 1/16" (CENTER RIB ONLY)
USE 24 STRANDS 3/16" FLAT BROWN (T-56) RUBBER LENGTH APPROXIMATELY 33". SHOULD SAFELY TAKE 800 OR 900 TURNS
FUSELAGE LONGERONS 1/8" SQ. HARD
CROSS BRACES 1/8" SQ. MED. HARD
1/32" DIA. WIRE HINGE PIN
ALL TIN FITTINGS 1/64"
GLUE SECURELY TO 1/8" SHEET FILL-IN
1/8" SQ.
1/16" DIA. WIRE
DETHERMALIZER
SILK
1/16" SHEET
1/8" SHEET ALL SIDES
1/16" SHEET TIP RUDDER
3/8" DIA. FIBRE BUSHING
3/32" DOWEL
3/16" SQ.
1/8" SHEET FILL-IN (ALL SIDES EXCEPT BOTTOM)
1/8" SHEET
1/16" DIA. WIRE
TIP RUDDER
1/8" SQ.
1/8" X 1/4"
DETHERMALIZER FUSE, 1/8" DIA. CORD SOAKED IN SALTPETER SOLUTION FOR 15 MIN. USE RUBBER BAND TO SECURE
TULSA GLUE DOBBERS
WHEELS ARE 1/8" BALSA. 1/8" HUBS CROSS-GRAINED
3/16" DIA. WASHER (BOTH SIDES)
1/16" SHEET
1/8" X 1/2"
ACTUAL WING AREA - 209 SQ. IN.
ELEVATOR AREA - 67 SQ. IN.
FUSELAGE X SECTION - 12.2 SQ. IN.
MEETS ALL WAKEFIELD REQ.
BEST OFFICAL TIME - 10:23.6
BEST UNOFFICIAL TIME - 50:20
DRAWN BY JOE D. KEHR