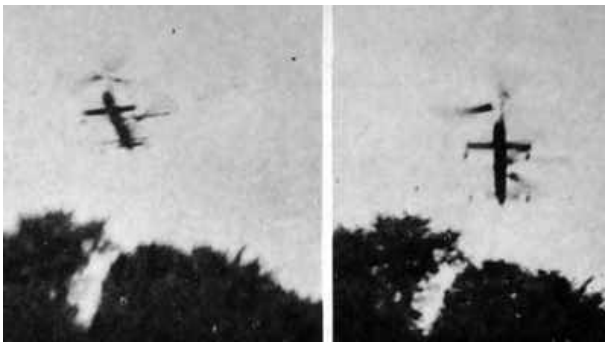
"This is one of my all-time bests," says the designer who has been acclaimed as one of the country's most original men of modeling. No fancy gimmicks here, no frills, just a little easy construction, and then lots of fascinating flying ahead



Tan-Giro

The Control-Line Gyro-Copter

By ROY L. CLOUGH, JR.

You'll stop the show when you put this spectacular rotary-wing job aloft. In flight it looks just like a big tandem rotor helicopter with lines reminiscent of the Piasecki and Bristol machines.

Although the appearance of the model is very close to the double-ended helicopter types it is really more closely related to the gyro-dyne family—rotary wing machines which may rise up vertically, like a helicopter, but which depend upon a propeller for forward motion. In this respect it is somewhat similar to an autogyro.

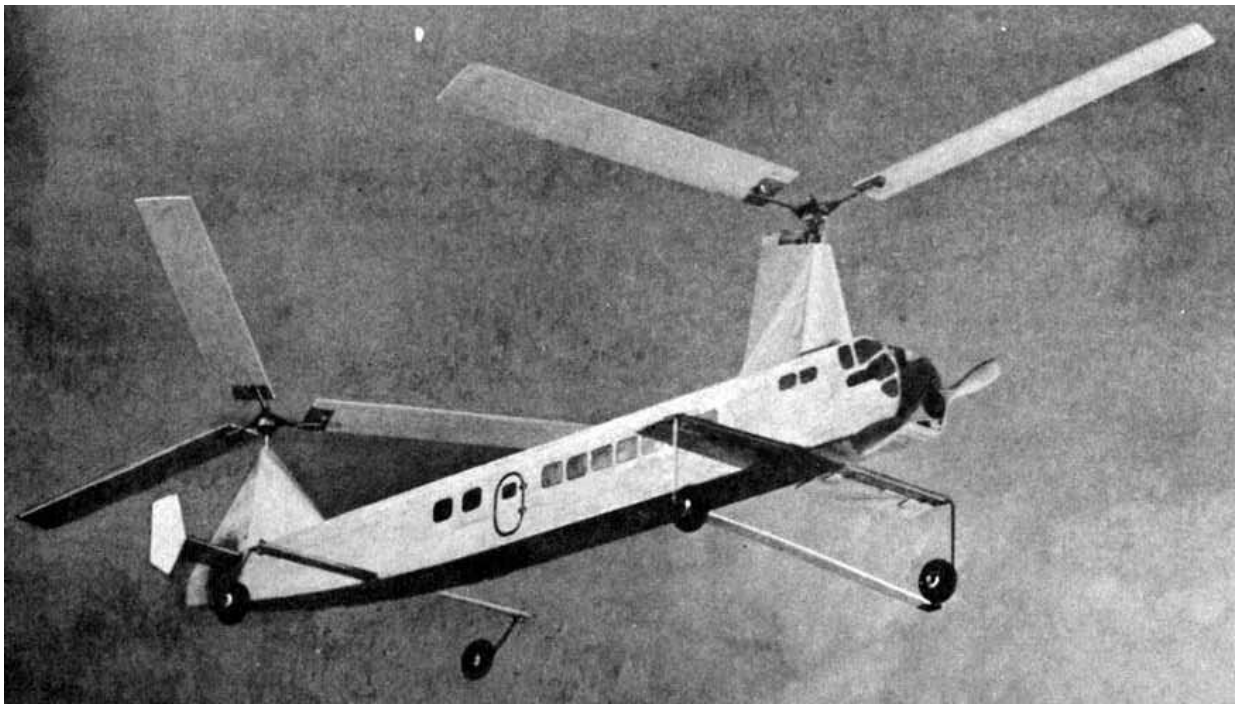
To avoid mechanical complication our model uses a short ground run instead of vertical take-off. With this system it is not necessary to power the rotors and taking off with forward speed is more practical in a controlled model because it keep the lines tight.

Okay, it sound great, but how does it handle? Is it hard to fly? How does it behave in a breeze?

The answers are that this model is actually easier to fly than the average sport job. The control response is very smooth and positive and it stays right out at the end of 50 foot lines with any good .19, as high as you'd care to fly any non-stunt type model of this weight, and the wind bothers it less than fixed wing models. There *is a* barely perceptible cyclic slap from the rotors, but, far from being a nuisance, this gives the "feel" of real rotary wing flying. You do not require any particular knowledge of rotary-wing craft to build and fly it successfully.

Begin with the fuselage which consists of two 3/32" x 3" x 36" sheet sides cut to shape. The bulkheads are 1/8" sheet and the two rotor mast carrying bulkheads should be cut from very hard stock, or else substitute plywood. You will note that the fuselage follows very conventional construction lines for sheet balsa building and requires little or no explanation except at the front end.

This model differs from usual control-liners in that the elevating surfaces are at the front end instead of the tail. Therefore study the control hook-up and be sure you understand it—the elevators are *depressed* to raise the nose, and *lifted up* to lower it, just the reverse of



usual. The landing gear arrangement should be followed; if you use a radial mount engine, for example, put in a plywood floor to bolt the landing gear firmly in place. Note the L.G. wire should not be firmly attached to the elevator cross-arm piece, but is held to it by rubber bands which act as shock absorbers. The motor mount depends upon the engine. We used a McCoy Sportsman .19 with rear rotor valving. This is about the top power which should be put in this model—in fact, if you go down to 35-foot lines, a good hot .09 engine might prove quite adequate.

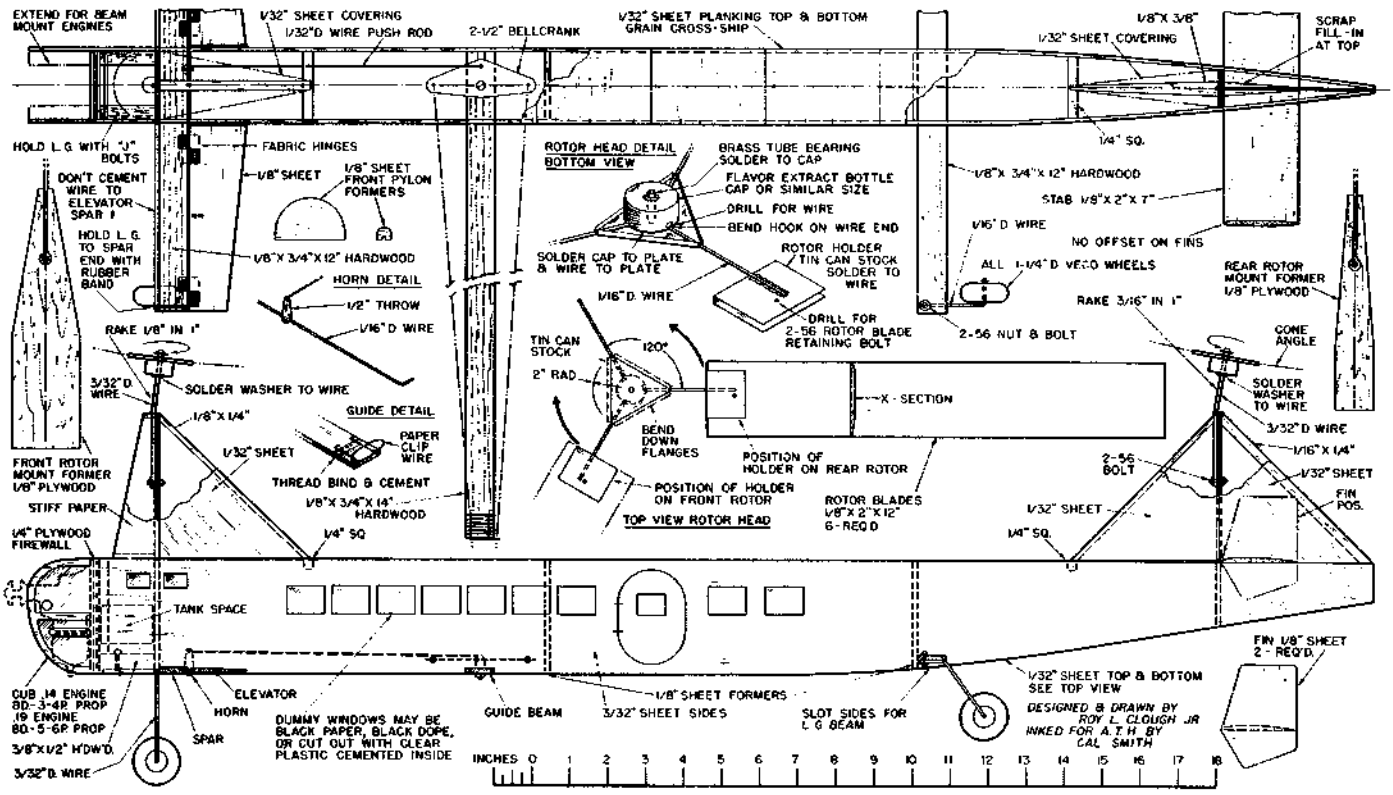
The rotors are very simple to build, but a good touch with a soldering iron is necessary. These rotors are not rigid as they may appear at a glance, but semi-flexible, which takes the cyclic jar and shock out and greatly increases the operating life. We mention this so you will not substitute a heavier wire than specified for the arms, or try to by-pass the soldering job by gluing up a solid wood rotor head. A glued-up rotor head seems simple and easy, and it is, but the catch is that if you equip the model with rotors like this you can expect cracked blades after the first flight and somewhere along about the third flight you will get an interesting shower of broken balsa as the rotors shatter under cyclic pounding.

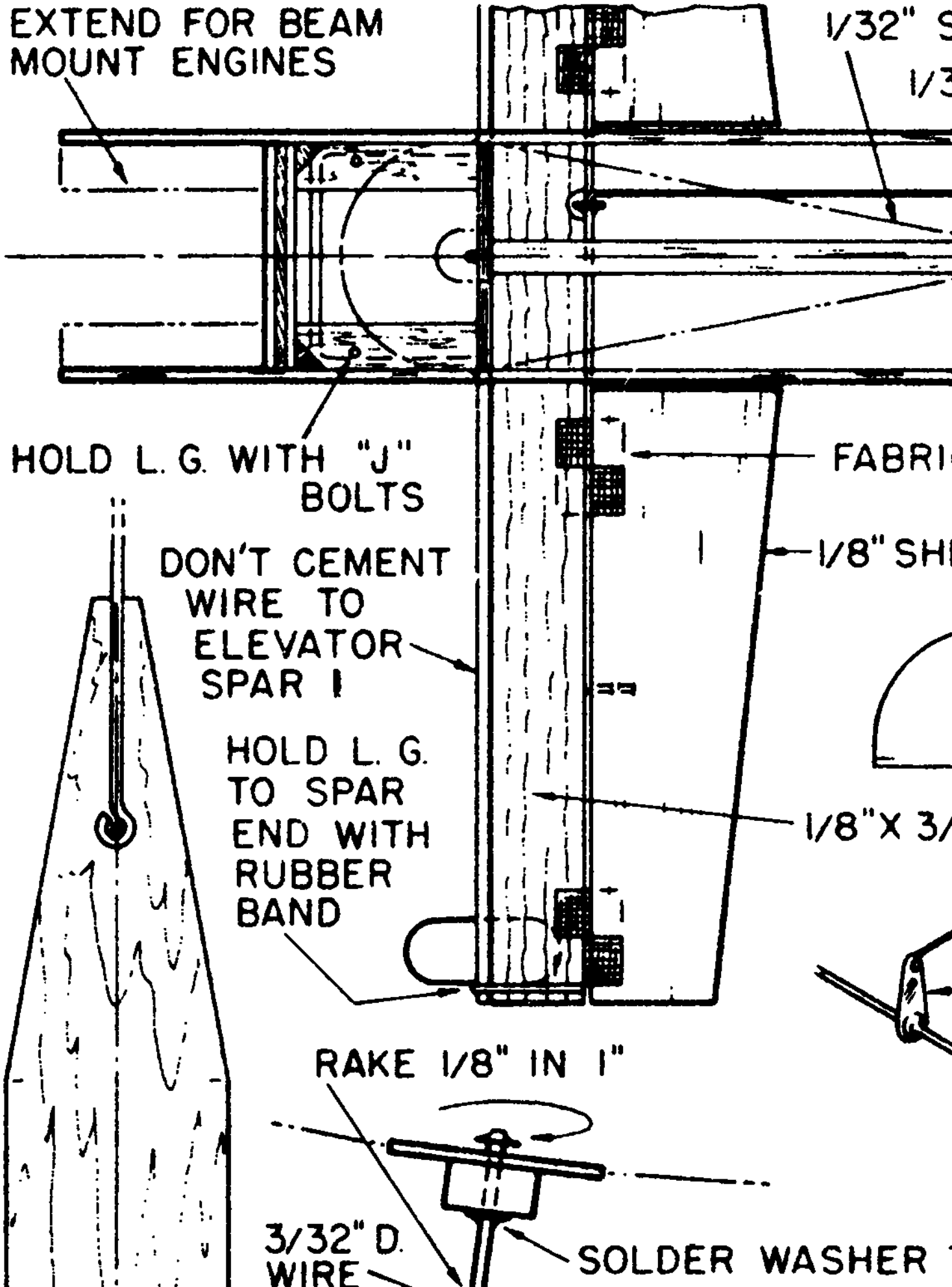
Clean metal and acid-core solder and an iron a bit hotter than necessary will insure a good job. You do not have to use bottle caps of the exact size shown, for anything similar which will fit is okay. Be sure to leave at least one inch of wire between the blade root and the hub for flexing. The cone angle should be as shown; if no cone angle is used the model will not fly well in level flight, but will have to be nosed up, which is sloppy. Be sure the rotor masts tilt at the correct angle; the rear rotor operates at a greater angle of attack than the front to compensate for downwash effects. This will not make the model nose in. When you assemble the rotors to the mast make sure they rotate freely; there should not be any great difference in the ease with which each bearing turns.

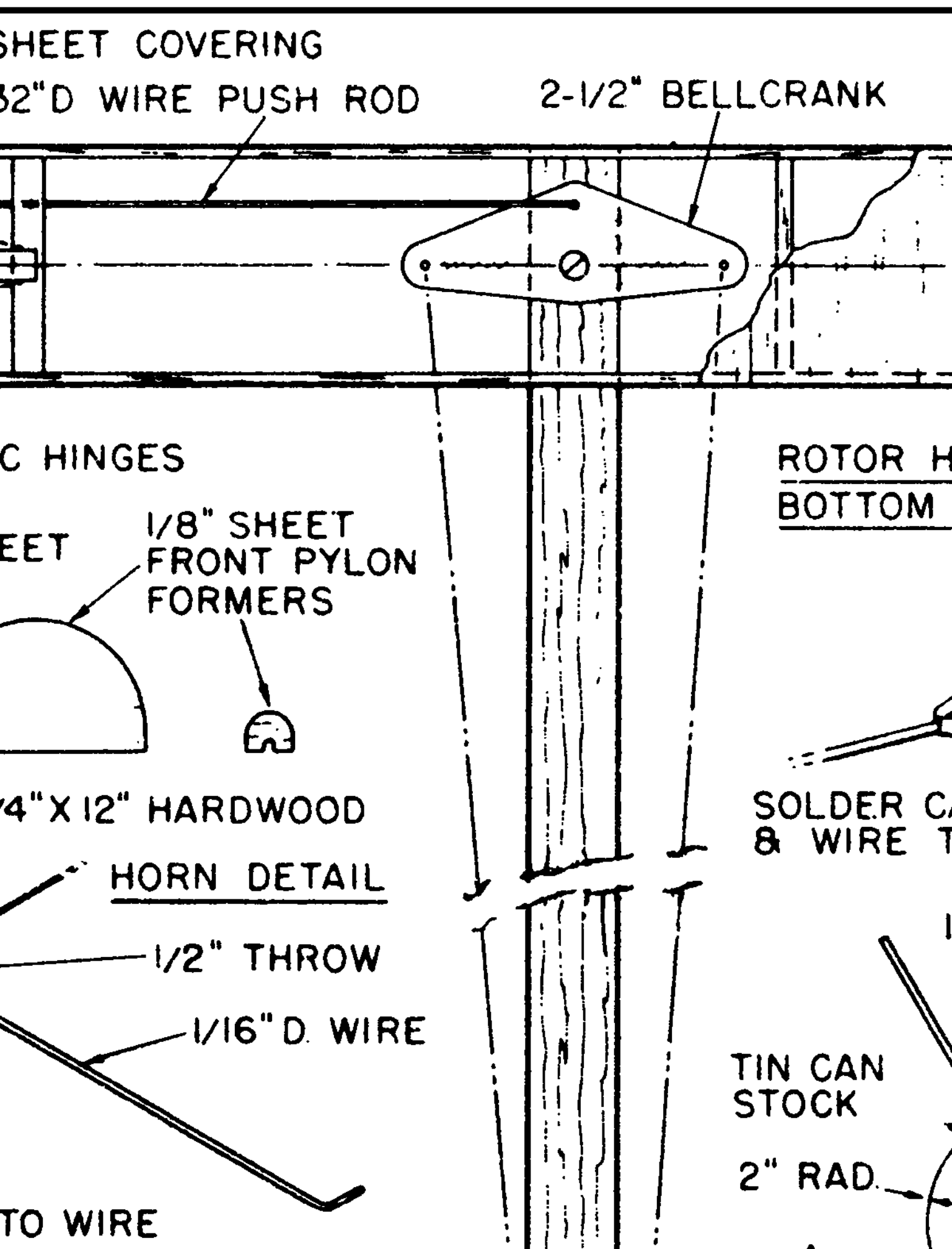
Flying the model is not much different than flying any sport job. The four-wheel gear produces exceptionally good ground stability, but do not neglect the usual down-wind take-off precaution—you have two big rotors here, plus a propeller, and if you flub a stall-off in a strong wind and the model rolls up in the lines it will take five years to untangle.

After a couple of normal take-offs under normal conditions you will learn the trick of yanking the nose up immediately after your helper releases the model, and then letting it drop back. This trick sets the rotors spinning very quickly and reduces an otherwise 15-20 feet take-off run by half. Spinning the rotors by hand before releasing the model does not work well and should be avoided. Near the end of the run, when the motor starts to sputter, bring the model down to five or six feet. When the motor dies bring it in gradually.

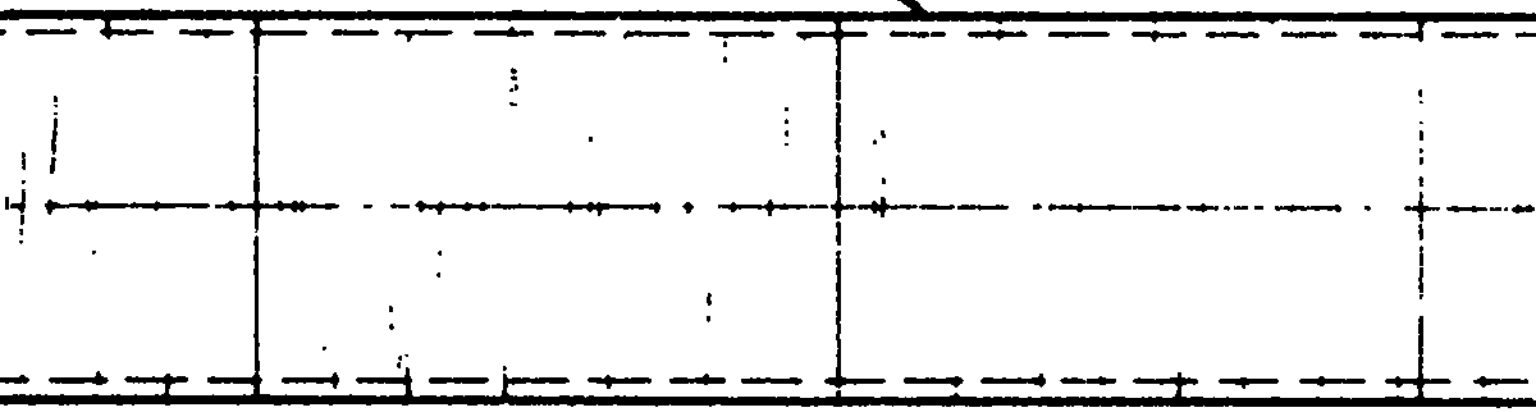
Full-size plans for the Tan-Giro are part of Group Plan *#955* Hobby Helpers, 770 Hunts Point Ave., New York 59, N. Y. (50c).

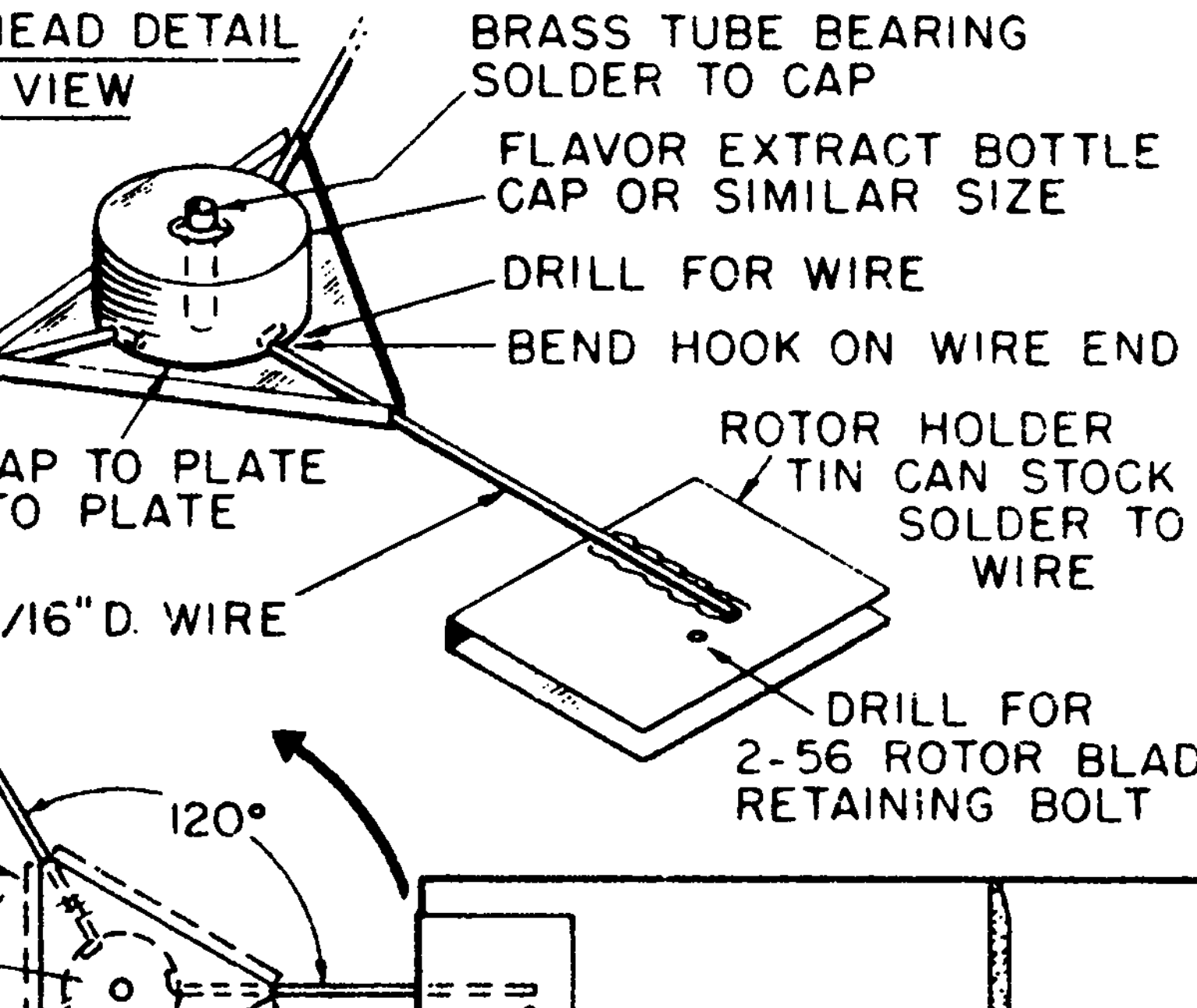


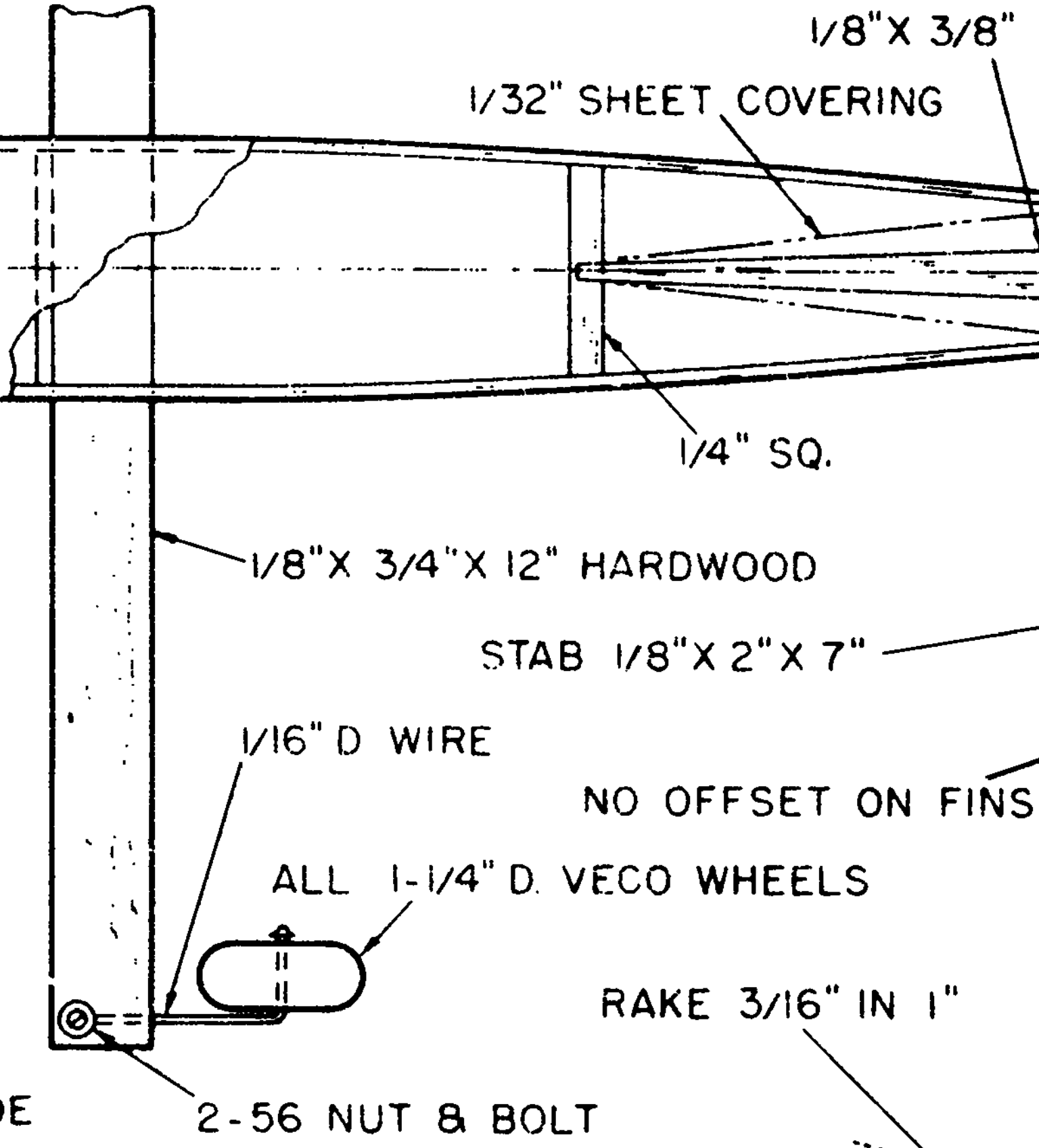

EXTEND FOR BEAM MOUNT ENGINES
1/32" S
1/3
HOLD L. G. WITH "J" BOLTS
FABRI
1/8" SHE
DON'T CEMENT WIRE TO ELEVATOR SPAR I
HOLD L. G. TO SPAR END WITH RUBBER BAND
1/8"X 3/
RAKE 1/8" IN I"
3/32" D. WIRE
SOLDER WASHER

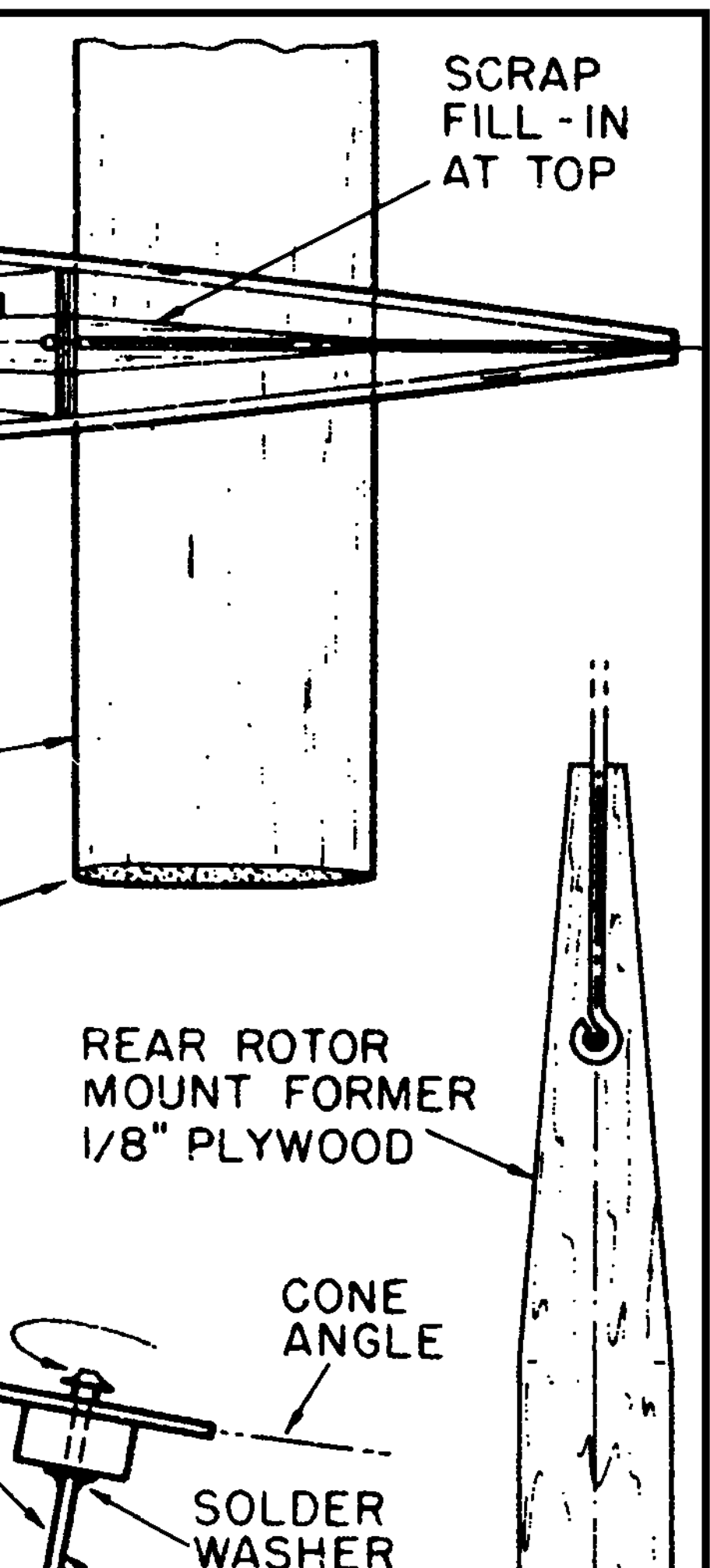

SHEET COVERING
32"D WIRE PUSH ROD
2-1/2" BELLCRANK
C HINGES
ROTOR H
BOTTOM
EET
1/8" SHEET
FRONT PYLON
FORMERS
4"X 12" HARDWOOD
HORN DETAIL
SOLDER C
& WIRE T
1/2" THROW
1/16" D. WIRE
TIN CAN
STOCK
2" RAD.
TO WIRE

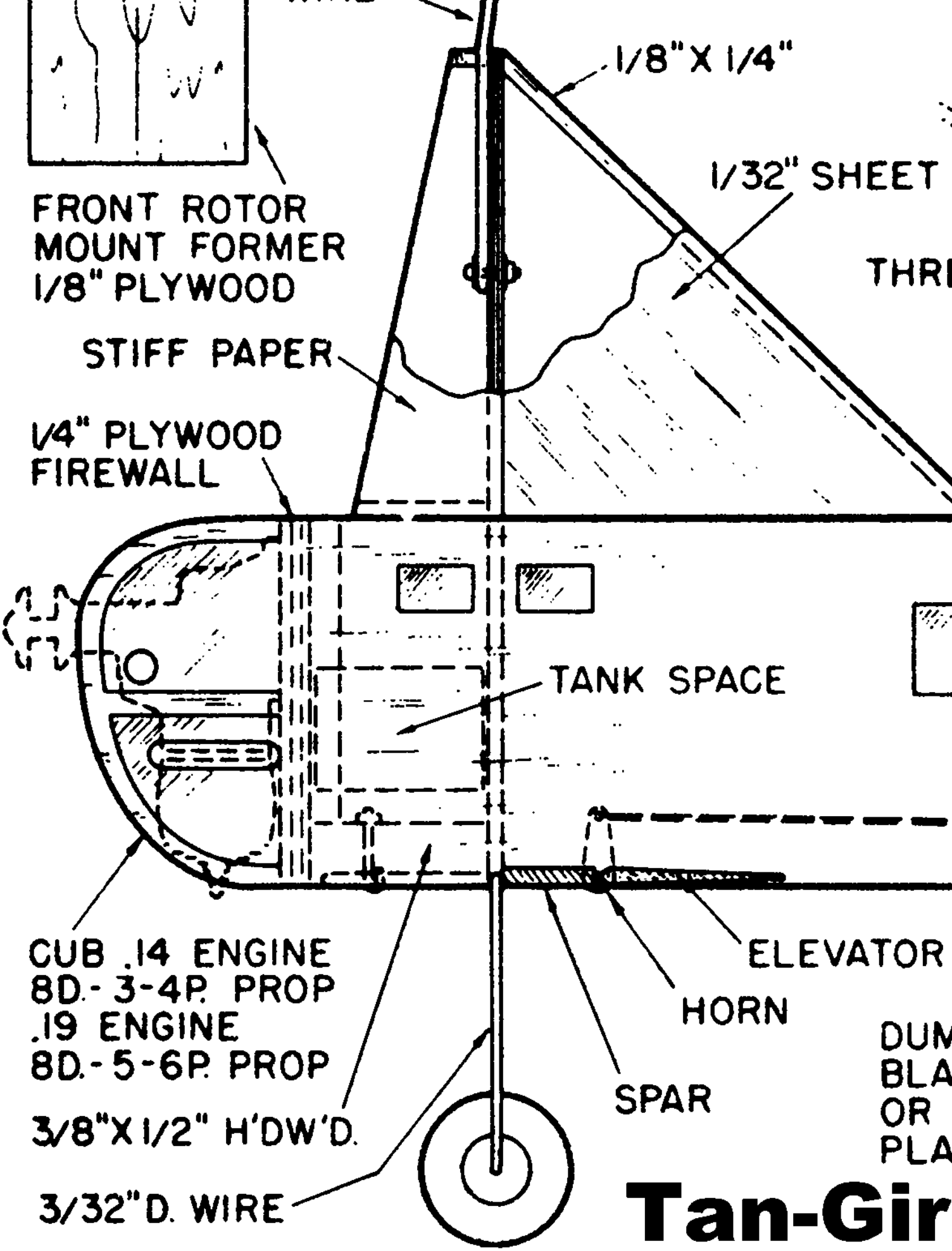
1/32" SHEET PLANKING TOP & BOTTOM
GRAIN CROSS-SHIP

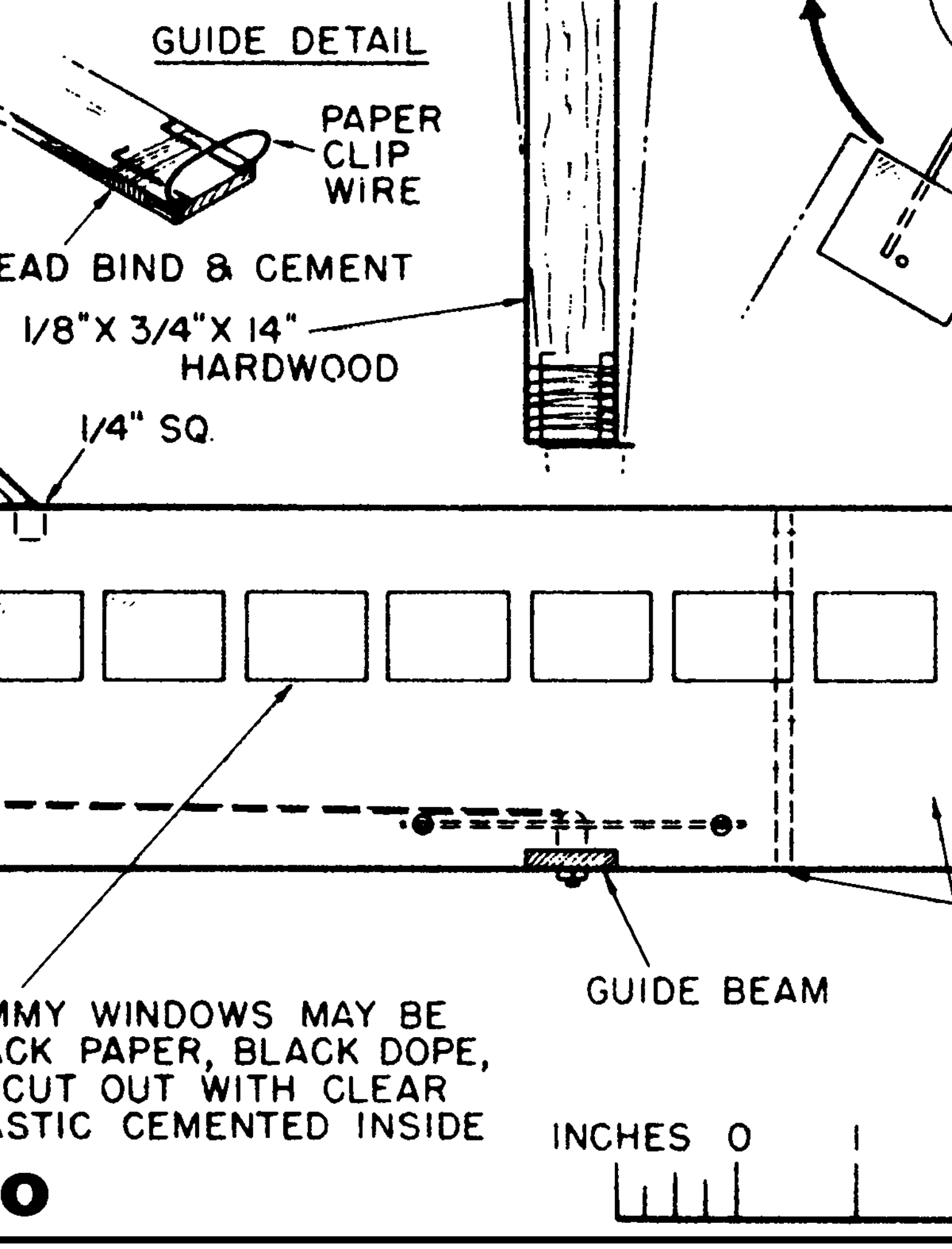





1/8"X 3/8"
1/32" SHEET COVERING
1/4" SQ.
1/8"X 3/4"X 12" HARDWOOD
STAB 1/8"X 2"X 7"
1/16" D WIRE
NO OFFSET ON FINS
ALL 1-1/4" D. VECO WHEELS
RAKE 3/16" IN 1"
2-56 NUT & BOLT


SCRAP
FILL - IN
AT TOP
REAR ROTOR
MOUNT FORMER
1/8" PLYWOOD
CONE
ANGLE
SOLDER
WASHER


1/8" X 1/4"
1/32" SHEET
THRI
FRONT ROTOR
MOUNT FORMER
1/8" PLYWOOD
STIFF PAPER
1/4" PLYWOOD
FIREWALL
TANK SPACE
CUB .14 ENGINE
8D.-3-4P. PROP
.19 ENGINE
8D.-5-6P. PROP
3/8"X1/2" H'DW'D.
3/32"D. WIRE
SPAR
HORN
ELEVATOR
DUM
BLA
OR
PLA
Tan-Gir


GUIDE DETAIL
PAPER CLIP WIRE
EAD BIND & CEMENT
1/8"X 3/4"X 14" HARDWOOD
1/4" SQ.
MMY WINDOWS MAY BE
ACK PAPER, BLACK DOPE,
CUT OUT WITH CLEAR
STIC CEMENTED INSIDE
GUIDE BEAM
INCHES 0 1

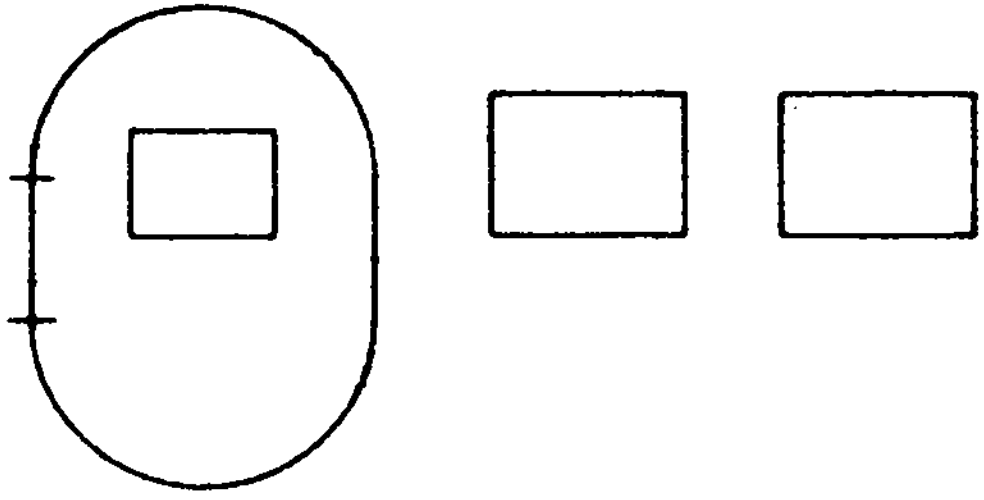
BEND
DOWN
FLANGES

POSITION OF
HOLDER ON REAR ROTOR

POSITION OF HOLDER
ON FRONT ROTOR

TOP VIEW ROTOR HEAD

ROTOR BLAD
1/8"X 2"X 12"
6-REQ D

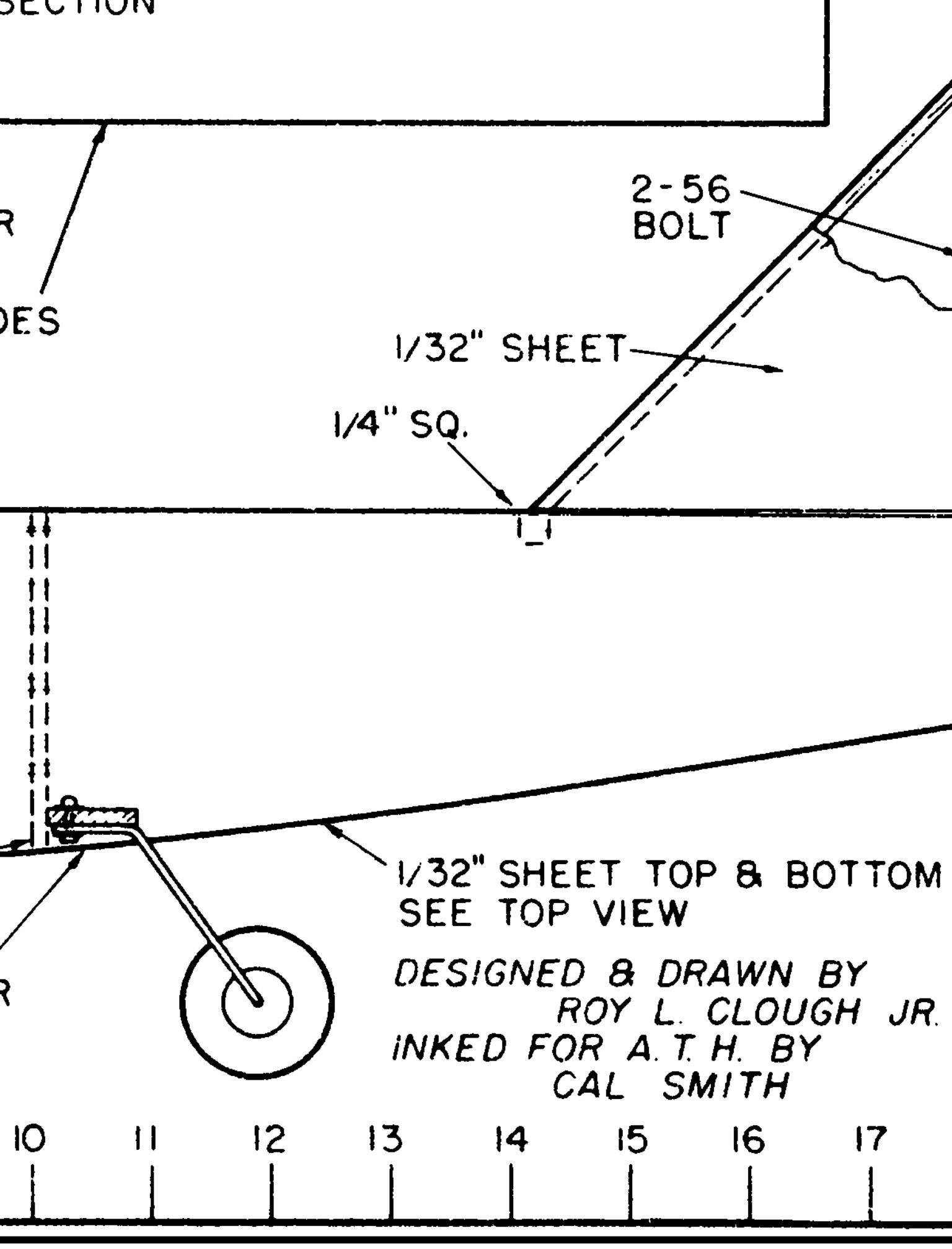


1/8" SHEET FORMERS

3/32" SHEET SIDES

SLOT SIDES FOR
L G BEAM

2 3 4 5 6 7 8 9


SECTION
R
DES
2-56
BOLT
1/32" SHEET
1/4" SQ.
1/32" SHEET TOP & BOTTOM
SEE TOP VIEW
DESIGNED & DRAWN BY
ROY L. CLOUGH JR.
INKED FOR A.T.H. BY
CAL SMITH
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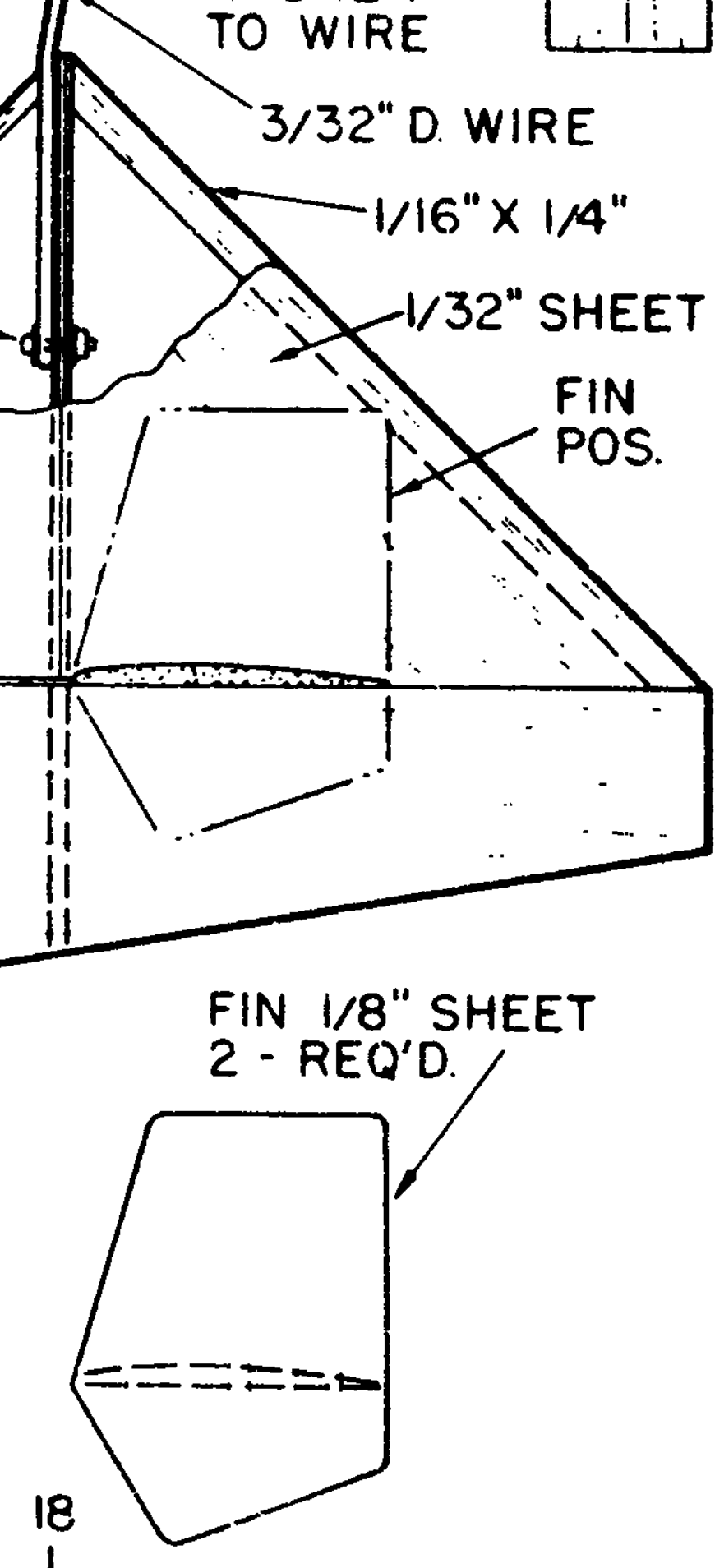
TO WIRE
3/32" D. WIRE
1/16" X 1/4"
1/32" SHEET
FIN
POS.
FIN 1/8" SHEET
2 - REQ'D.