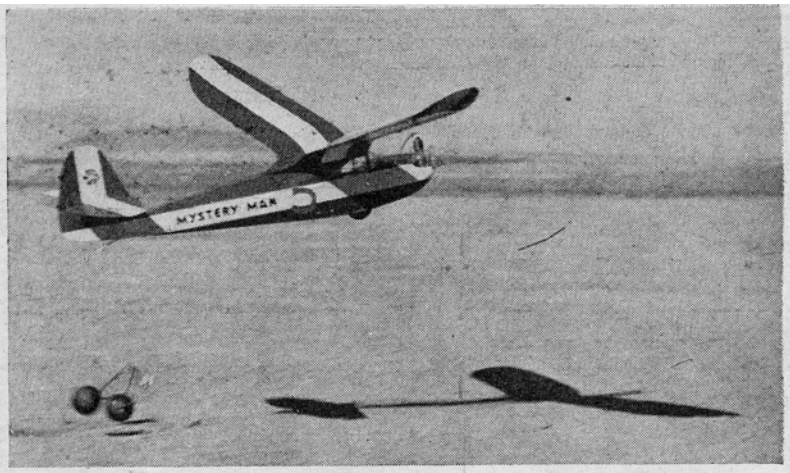
# The Mystery Man

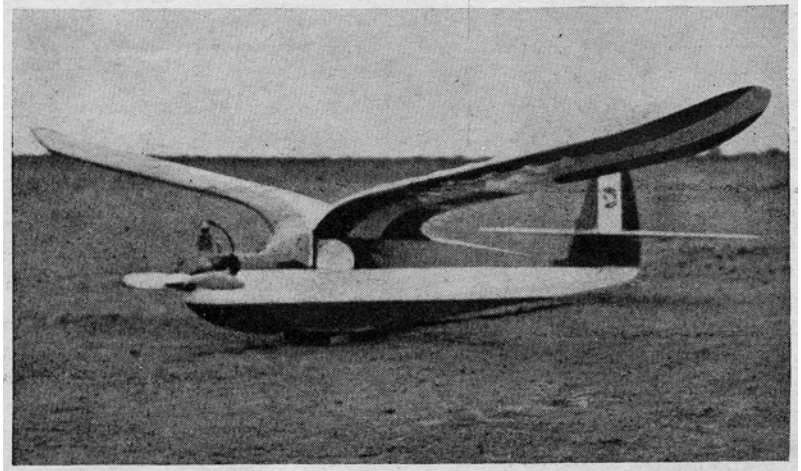
## by ELBERT J. WEATHERS

**PART 1**

THIS gas model is one which has taken three and one-half months of steady work to produce, from the drawing board to the first test hop. The idea of the ship lifting from the "take-off gear" was the basic one around which the design was produced. This device has enabled the writer to build a one-wheel landing-gear ship which, due to its general design resembles greatly a sail-plane, especially when soaring on the glide.

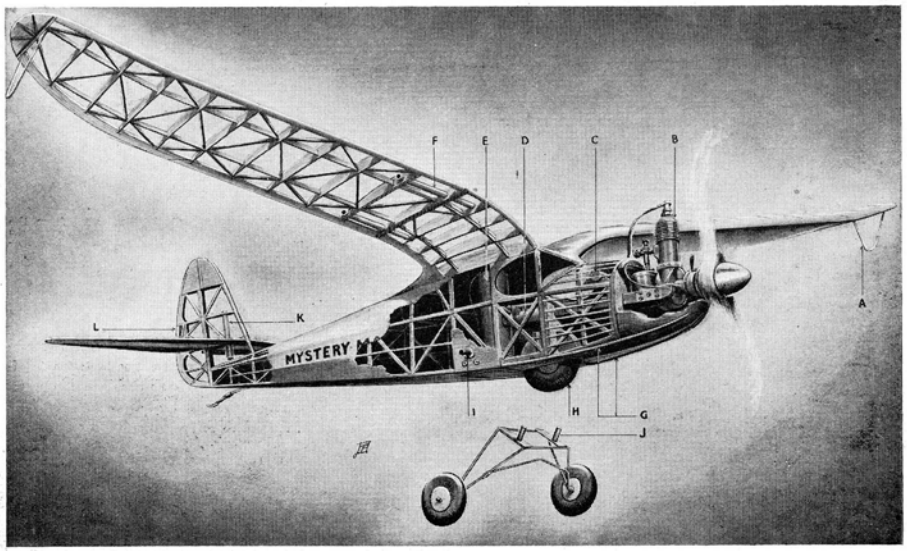



Action! A remarkable take-off shot, showing the dolly on the ground just toppling over. Climb is a left-hand corkscrew. Wing loading is 15.36 oz./sq. ft.



The model has a glide like a sailplane. The ship rolls almost to a standstill before even a wing-tip skid touches the ground. No ground loops, either!

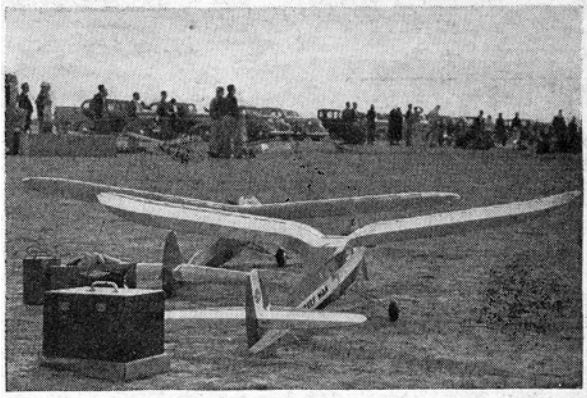
The fact that this idea has shown a loophole in N. A. A. rules in regard to "dropping parts in flight" has come about since its completion, and its designer had no intention whatever of attempting to sneak around this rule in developing it. His main thought was that several one-wheel jobs, with the landing gear or single wheel resting in fuselage bottom (sailplane Style), had all employed complex mechanism, at least to some degree, to retract the wheel after the take-off. Therefore, as simplicity is the sound answer to anything and the most practical, why shouldn't the model lift from a dolly on the take-off, and thus eliminate all retracting mechanism? This feature allows the drag from the landing gear to be minimized, and improves greatly the frontal resistance as compared with even the more common type of one-wheel landing gear, that of the wheel being below the fuselage housed in a streamlined "leg," which is of course necessary for propeller clearance. The model presented here also supports itself on the take-off, which cannot be claimed for ordinary one-wheel, landing-gear jobs.



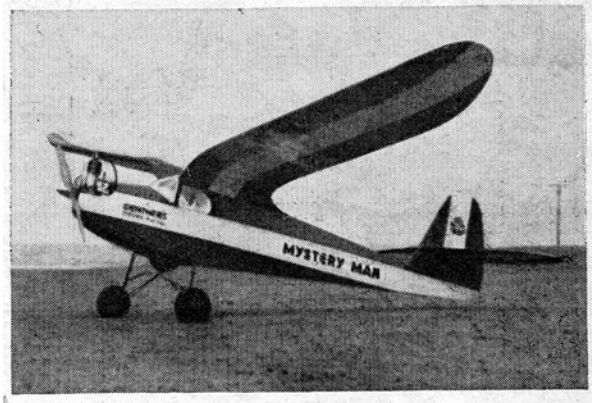

A—wing skids; B—Brown engine; C—condenser; D—coil; E—battery tube; F—attachment for detachable wings; G—landing skids; H—monowheel; I—switch and booster plugs; J—take-off dolly; K—detachable fin; L—rudder tab.

Another problem which had to be overcome was the proper distribution of weight of the take-off dolly as compared with the center of lift of the wing. The dolly in the accompanying plans is the third one to be designed, and allows the plane to take off without any danger of ground-looping or snapping. It operates purely by laws of gravity, and as can be seen in the photos never leaves the ground, being pitched forward to fall flat by the fast-moving-plane. The dolly bounces somewhat because of the rubber tires,

when settling flat. Therefore, the builder making this ship should conform to the plans in every respect.



The Mystery Man at one of the Coast contests. Although just a recent design, it has already proved a winner.




This view shows the gull wing to excellent advantage. Notice the luster of that finish? Some job.

The fact that the ship was to be flying under power without the usual stabilizing unit of a conventional-type landing gear, underneath, involved precise calculation with reference to the center of gravity, center of lateral area, and center of pressure, and their relation to each other. The C. G. is located just below the top main longeron of the fuselage frame, or just below the side cabin windows. C. of L. A. is just behind in proper relation and the combination of the high C. G. and C. P. has created a model which climbs under power without being in a dangerous vertical bank—as is the case with most retracted-wheel ships—-at any time, and which cannot possibly spiral-dive under power, as the flight attitude of the original Mystery Man shows that it is very remote from this well-known danger.

The ship has a spectacular rate of climb, going up like a left-hand corkscrew, and having plenty of altitude after a thirty-second motor run. The glide is very flat, and due to the

gulled wing and upturned wing tips, together with the sailplane-type landing gear, the model possesses all the characteristics of a sailplane when gliding, flying in lazy circles and soaring on the slightest of thermals. When it comes in for the landing, it is so flat that on smooth ground the ship doesn't even bounce, and not until it has rolled to practically a standstill does either wing tip drop to the ground on its skid. The model does not show any tendency to ground loop when landing.

The original has been designed to have a perfectly flat glide, with its neutral setting of stabilizer, wing, and also line of thrust.

The motor used is a Brown Jr. Model B, although similar engines of the same horse-power rating can be adapted to the motor bed. The ship can be flown on one-sixth horsepower, although the rate of climb will obviously be cut down. With the above in mind regarding the neutral settings on all surfaces, it is necessary therefore to place such units as coil, battery case and so forth exactly as indicated. The battery case used is of the type sold for gas-model use, but actually is nothing more than a heavy-duty mailing tube of thick cardboard and metal end-caps. (One end is screw top for battery removal.) The model happens to pass with ease all rulings regarding cross-section area of fuselage, although this fact was mere coincidence, as other problems had to be overcome at the time which were of more importance to its designer than this.

## FUSELAGE

In building the fuselage, use conventional methods except for those peculiar to this model. Build the basic frame (that portion below the middle longerons as per side view) and then add the top portion. Next comes the battery case, coil, and the condenser installations, followed by the fire wall and the complete engine bearers. Leave the nose block, windshields and fairings off, as these will be explained in Part Two next month.

Use the standard wiring hook-up. The booster jacks and switch are mounted on a 1/8” sheet panel on the right side in the positions shown, and the motor run. Timer wires should extend up through the center section above the battery case, where the timer will eventually be mounted. Now fill the panels above the middle longeron on each side of the battery case with 1/8” sheet.

Study the monowheel installation before actually assembling it. Note the wheel-cover and axle-mounting details. When mounting the ½" aluminum-tube dolly sockets, cement all the parts except the tubes, which must be left until it is seen that the dolly dowels will slide out easily.

## TAKE-OFF DOLLY

The three-view detail of the dolly gives all the necessary dimensions. The 1/8" L. G. wire is bound with copper wire and soldered. The galvanized plates are sweated on, including the reinforcing wire lengths shown by the broken lines on the top view. The dowels are tapped 6-32 and bolted and soldered in place. The total weight should be about ten ounces with three 1/2" wheels.

## TAIL SURFACES

Assemble the tail frames as per plans. Note that they taper in section. When the frames are complete and smoothed up, remove rib F-4 temporarily while setting the stabilizer in place. Check the tail members for line-up on the fuselage before cementing permanently. For convenience and safer transportation, the upper portion of the fin, including the stabilizer, is removable, and so de-signed to pivot if struck, by shearing away the dress snaps.

That's about all for this part, so assemble that bill of materials that follows, and next month the construction of a unique wing and data to complete the model will be given.

(Editor's Note: Drawings for the Mystery Man were prepared by Alan D. Booton; cutaway by Frank Tinsley.)

## BILL OF MATERIALS

**Sheet Balsa**
5 pcs. 1/16 x 3 x 36”
1 pc. ¼ x 3 x 36”
4 pcs. 1/8 x 3 x 36”
1 pc. 3/32 x 3 x 36"

**Strip Balsa**
10 pcs. ¼ x ¼ x 36”
2 pcs. 5/16 x 5/8 x 24”
1 pc. 5/16 x 5/8 x 18”

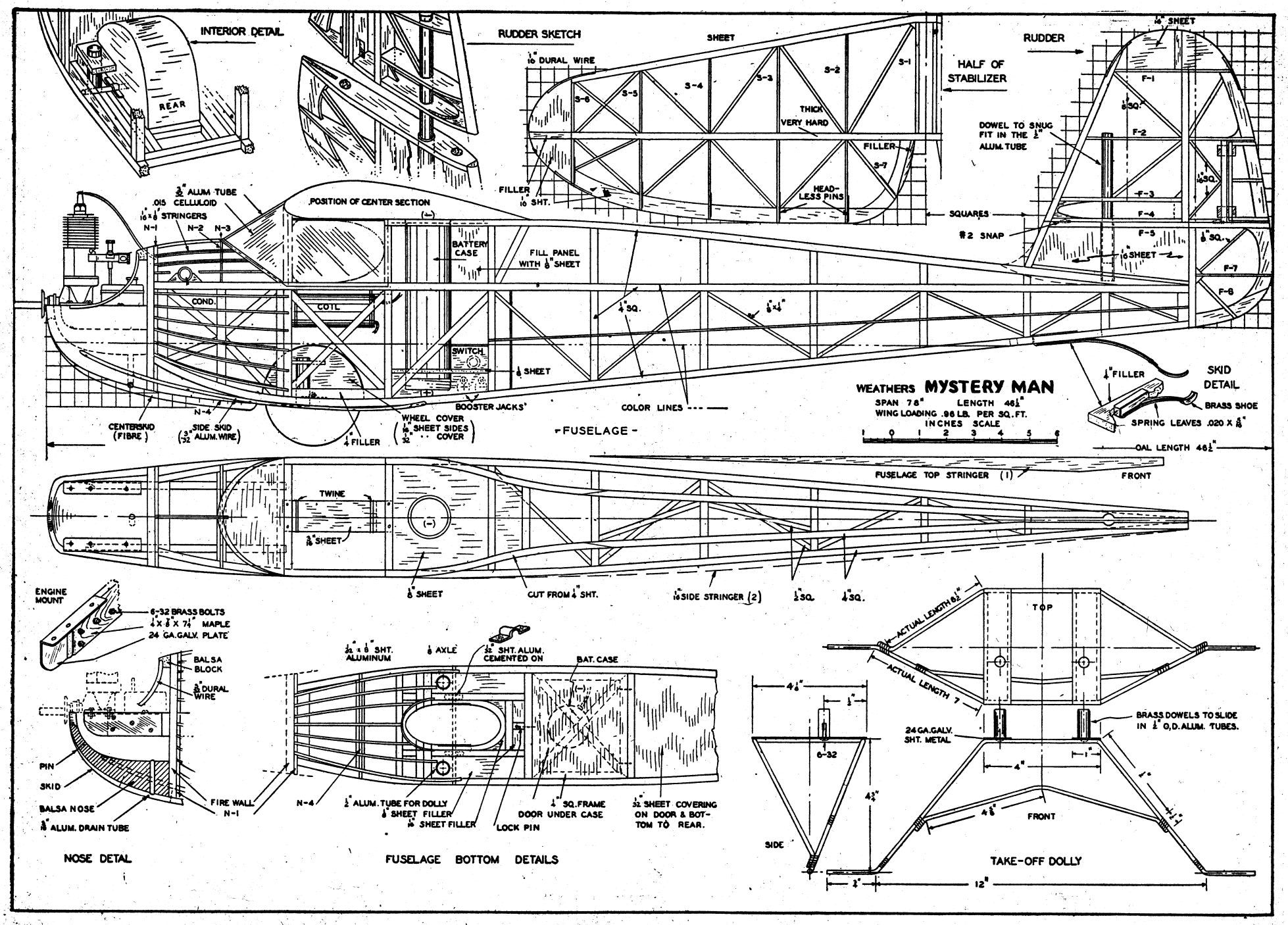
10 pcs. 1/8 x 1/8 x 36"
6 pcs. 3/32 X 3/32 X 36"
1 pc. ¼ x ¾ x 36"
1 pc. 5/8 x 7/8 x 18”

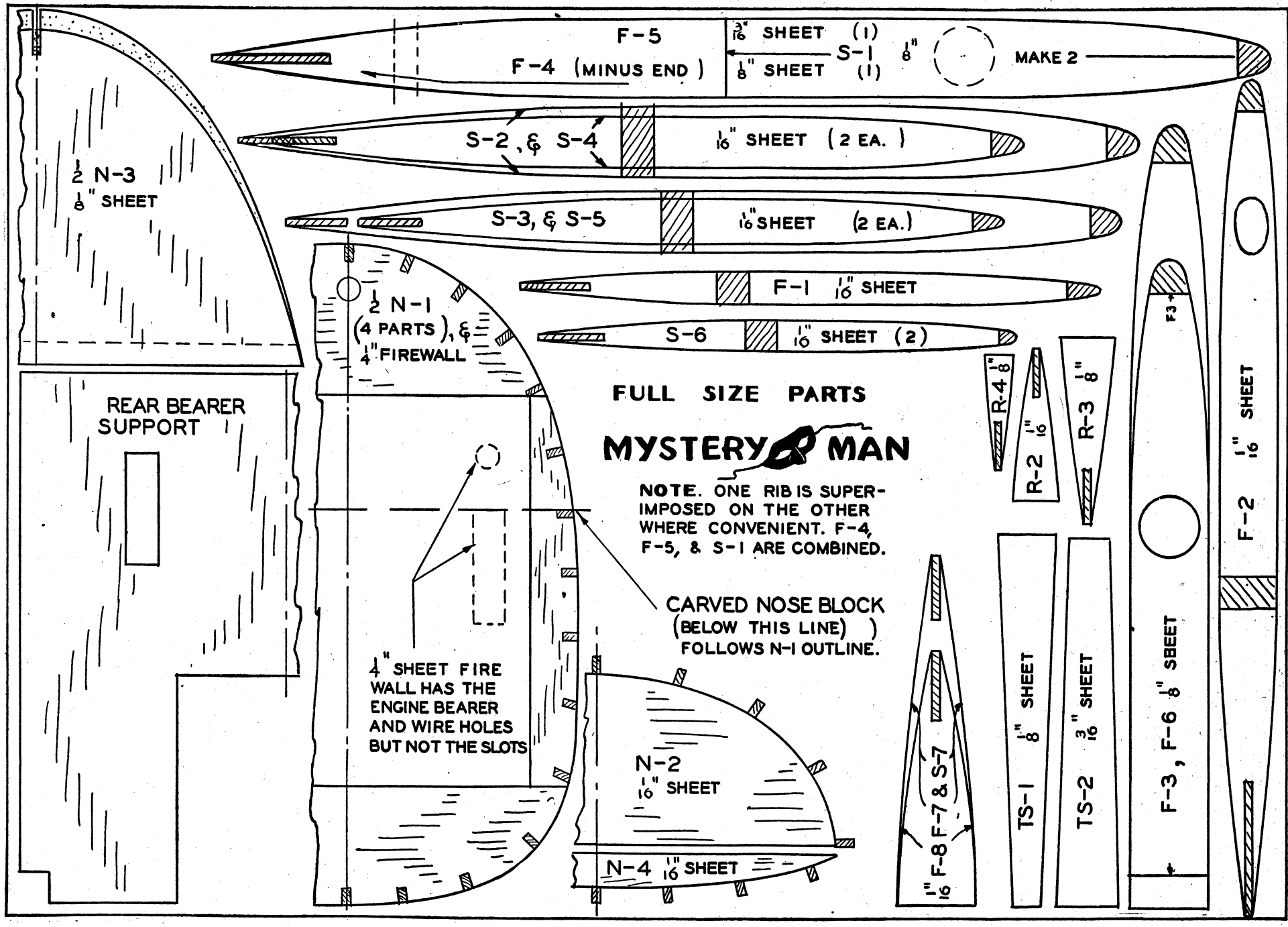
**Miscellaneous**
Balsa block, 3 x 3 1/2 x 3 3/4"
1 sheet basswood, 1/8 x 2 1/2 x 30"
1 sheet 3-ply hardwood, 1/8 x 3 1/2 x 15"
2 pcs. black walnut or maple, ¼ x 7/8 x 7 1/4"
Hardwood dowel (maple) to fit ½ " O.D. aluminum tubing snugly, 18"
Hardwood dowel (maple) to fit 3/8" O.D. aluminum tubing snugly, 12"
½ yd. Flightex or similar good quality cloth covering material
4 sheets bamboo paper, 2X3'
2 5-ft. lengths 1/8" dia. piano wire
3 3 ½ " gas-model wheels, pneumatic type
12" length of ½ “ O. D. aluminum tubing
6 ½ “ length of 3/8 “ O. D. aluminum tubing
1 sheet celluloid, .015 x 6 x 8"
2 pcs. brass rod 7/16 “ dia. x 1"
1 pc. 27-gauge galvanized sheet metal, 2x4"
1 pc. 22-gauge galvanized sheet metal, 3 x 31/2"
Battery case (2-cell). (Mailing-tube type on market, or can be made from flashlight case)
1 small "button" type main switch
1 Autoknip Timer
2 booster sockets
6 ft. small insulated wire
18" of larger insulated stranded wire for wiring between condenser and engine, about l/8" dia.
Strip of clock-spring steel, .031 x5/16 x 13"
1 pint cement, also supply of metallic-type cement. (Can be made from clear cement by addition of alumi-num powder of not-too-fine grade)
Aluminum wire, 1/16" dia. x 24" (including supply for wing-panel locking pins)
1 quart clear nitrate dope
Pigmented dope as desired
Duraluminum wire, 3/32" dia. x 8"
Aluminum-foil paper (for finish of cabin)
Aluminum rod, 1/8" dia. x 24"
2 doz. 8-32 brass machine screws, nuts (1/2 “ length)
4 4-36 steel machine screws, nuts (1/2” length)
2 ½ x 1/8” shank Parker-Kalon self-taping metal screws

1 pc. red sheet fiber, 1/8 x 1 x 8"

Metallic cement is recommended for installation of the following parts:
**Fuselage**: landing-wheel axle and hangers; fiber skid; aluminum tubing oil drain; tubing in fuselage for take-off gear; aluminum tubing windshield brace; wooden engine beams; wire frame from fire wall to nose block; aluminum rod fuselage skids; booster plugs and main switch; pins in battery-compartment door; tail skid on filler block; aluminum tubing in fin stub; dress snaps on fin stub; aluminum former strip around landing wheel.
**Stabilizer**: aluminum wire stiffener strips at tips.
**Fin**: aluminum wire stiffener strips at tip; dress snaps on rib F-4; sheet aluminum hinges connecting tab.

*To Be Continued.*


INTERIOR DETAIL
REAR
RUDDER SKETCH
SHEET
1/16" DURAL WIRE
S-1
S-2
S-3
S-4
S-5
S-6
S-7
THICK VERY HARD
FILLER
HEAD-LESS PINS
FILLER 1/16 SHT.
HALF OF STABILIZER
RUDDER
1/16" SHEET
F-1
F-2
F-3
F-4
F-5
F-7
F-8
1/8 SQ.
1/16 SQ.
DOWEL TO SNUG FIT IN THE 1/4" ALUM. TUBE
SQUARES
#2 SNAP
1/16 SHEET
1/8" SQ.
3/32" ALUM TUBE
.015 CELLULOID
1/16 x 1/8" STRINGERS
N-1
N-2
N-3
POSITION OF CENTER SECTION
BATTERY CASE
FILL PANEL WITH 1/8" SHEET
COND.
COTL
SWITCH
1/8 SHEET
1/4 SQ.
1/8 x 1/4"
CENTERSKID (FIBRE)
N-4
SIDE SKID (3/32" ALUM. WIRE)
1/4 FILLER
WHEEL COVER 1/16" SHEET SIDES 1/32" COVER
BOOSTER JACKS
COLOR LINES
FUSELAGE
WEATHERS MYSTERY MAN
SPAN 78" LENGTH 46 1/2"
WING LOADING .98 LB. PER SQ. FT.
INCHES SCALE
1 0 1 2 3 4 5 6
1/4" FILLER
SKID DETAIL
BRASS SHOE
SPRING LEAVES .020 X 1/8"
OAL LENGTH 46 1/2"
FUSELAGE TOP STRINGER (1)
FRONT
TWINE
3/16" SHEET
1/8" SHEET
CUT FROM 1/4" SHT.
1/16" SIDE STRINGER (2)
1/2" SQ.
1/4" SQ.
ENGINE MOUNT
6-32 BRASS BOLTS
1/4 x 1/8 x 7 1/4" MAPLE
24 GA. GALV. PLATE
BALSA BLOCK
3/8" DURAL WIRE
PIN
SKID
BALSA NOSE
1/8" ALUM. DRAIN TUBE
FIRE WALL N-1
NOSE DETAL
1/32 x 1/8" SHT. ALUMINUM
1/8 AXLE
1/32" SHT. ALUM. CEMENTED ON
BAT. CASE
N-4
1/2" ALUM. TUBE FOR DOLLY
1/8" SHEET FILLER
1/16" SHEET FILLER
LOCK PIN
1/4" SQ. FRAME DOOR UNDER CASE
1/32" SHEET COVERING ON DOOR & BOTTOM TO REAR.
FUSELAGE BOTTOM DETAILS
TOP
ACTUAL LENGTH 8 1/2"
ACTUAL LENGTH 7
BRASS DOWELS TO SLIDE IN 1/2" O.D. ALUM. TUBES.
24 GA. GALV. SHT. METAL
4 1/8"
1/2"
6-32
4 1/2"
SIDE
4"
1"
4 1/8"
FRONT
3"
12"
TAKE-OFF DOLLY


F-5
F-4 (MINUS END)
3/16" SHEET (1)
S-1
1/8" SHEET (1)
1/8"
MAKE 2
S-2, & S-4
1/16" SHEET (2 EA.)
S-3, & S-5
1/16" SHEET (2 EA.)
F-1 1/16" SHEET
S-6
1/16" SHEET (2)
1/2 N-3
1/8" SHEET
1/2 N-1
(4 PARTS), &
1/4" FIREWALL
REAR BEARER
SUPPORT
FULL SIZE PARTS
MYSTERY MAN
NOTE. ONE RIB IS SUPER-IMPOSED ON THE OTHER WHERE CONVENIENT. F-4, F-5, & S-1 ARE COMBINED.
CARVED NOSE BLOCK
(BELOW THIS LINE)
FOLLOWS N-1 OUTLINE.
1/4" SHEET FIRE WALL HAS THE ENGINE BEARER AND WIRE HOLES BUT NOT THE SLOTS
N-2
1/16" SHEET
N-4 1/16" SHEET
R-4 1/8"
R-2 1/16"
R-3 1/8"
F3
F-2 1/16" SHEET
F-3, F-6 1/8" SHEET
1/16" F-8 F-7 & S-7
TS-1 1/8" SHEET
TS-2 3/16" SHEET