by Bill Siegel

THE "SEA GULL" SOARER

Span is 101"

Wing Area: 770 sq. inches

Fuselage: 45" Overall

Oops! Engine stall at the wrong moment. You can't win them all. Ship's sufficiently thick-skinned to survive aftermath. Familiar?

C&S Receiver . . . Rudder Only . . . G&M Mini-combo Servo

Also flown with 4-Channel unit, Atlas, Bonner, Annco Servos.

Stab: 25%

Tail Moment: 27%

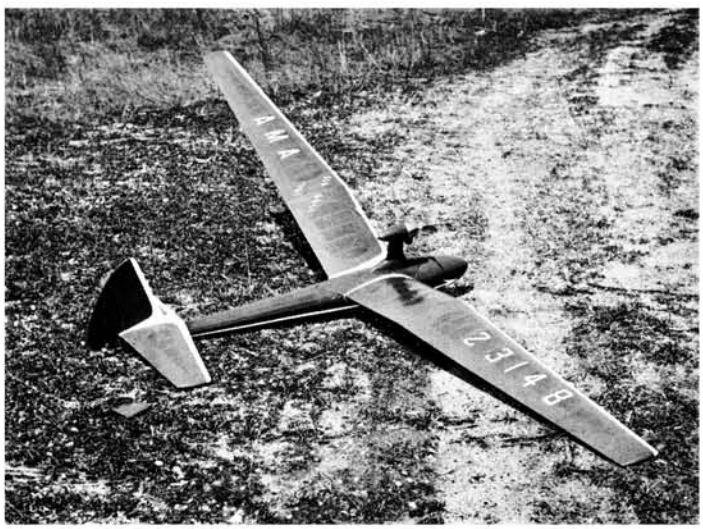
Power: .09 to .15's

What conceivable urge would drive an apartment bound modeler with a 36" building board to get involved with a ship of this size? A fascinating series of articles in the 1955-57 Yearbooks by Frank Braithwright, dramatically describing record breaking soaring flights "way down under," provided the basic inspiration. Further day dreaming led to a decision to design a completely romantic ship, one that would be graceful and majestic in flight and fulfill a dream that we're sure every modeler has had at one time or other, to see a real "cream puff" stately soaring between cumulus clouds on a sunny day.

Now, a bit about the design: This is not a pure theory ship, as compromises were always made in favor of the esthetic appearance. To those who would criticize the use of gull dihedral, we can only say that the basic aim was to get away from the more mundane R.C. jobs. This is the finalized version of two predecessors and in the field for which it was designed it flies beautifully. Let's leave the inverted Figure 8's for the "real nervous crowd."

On both wing and stabilizer we used a thickened up Clark Y with a sharp entry. This was done because most of the large ships that we've flown using undercamber never had the wind penetration to punch through the tur-

Full Size "Timely" Plan Available!



Above: A gentle gull wing lowers C.G., performed well in all flight tests. At left: Designer Bill Siegel, ex-stunt pilot, displays finished "Sea Gull".

"SEA GULL"

... continued ...

Above: High aspect ratio, sheeted wing edges, sparless. Fuselage is circular, formers on keel, 1/8" strip planked, sanded.

SINGLE CHANNEL RADIO CONTROL

bulence encountered in a thermal. The predecessor of this ship had 4% undercamber and had that nasty "stop and go" jiggling, when crossing gusts. Now we'll grant that this version does have a higher sinking speed, but we feel the cleaner flying and the ability to fly in higher winds compensates for it.

The very first version utilized a 33% stabilizer, which is what we were accustomed to with most free-flights, using a 50% moment arm. Messing around with odd stabs, we worked our way down to 27% on the second version and only 25% on the present one. To sceptics, we can only say that the stab and moment arms shown here work. There is no tendency for stalls to build up, and flare-outs are dead level. This may, in part, be due to the thickness of the stab section and the fact that it is riding in clean air. At any rate, the "proof of the pudding," etc.

Due to the turbulence of a pod motor-mount and gull wing, we chose a very large fin and rudder. This was learned the hard way on previous designs, as with the power-pod gull wing setup, when coming out of a turn, the ship would heel over and settle for a moment, during which time she wouldn't respond. The only solution that gave really instant control was a very high fin with the rudder set as far back as possible. We suggest that until you become accustomed to flying this type of model, you restrict the rudder movement to 7° left, 10° right. Later on, you can let her go to 15° each way.

This particular ship originally had an enormous plywood skid under the nose to lower the C.L.A. However, this was gradually whittled down to token size, as the ship never really needed it. In fact, you can put the "Sea Gull" almost completely on her side and she will not show any tendency to spin (she doesn't even seem to lose altitude, but maybe we're prejudiced.

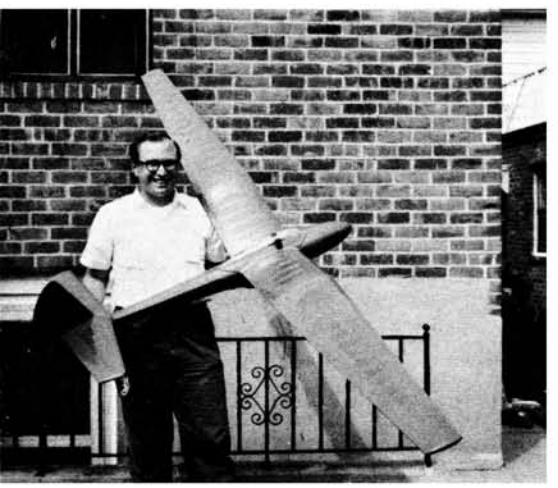
The only possible change in the entire force setup which hasn't been explored is cutting down the motor pod and mount area, with a corresponding reduction in the fin area. This is mentioned only because someone may build the "Sea Gull" for slope soaring sans motor pod, and here we think there may be some room for whittling.

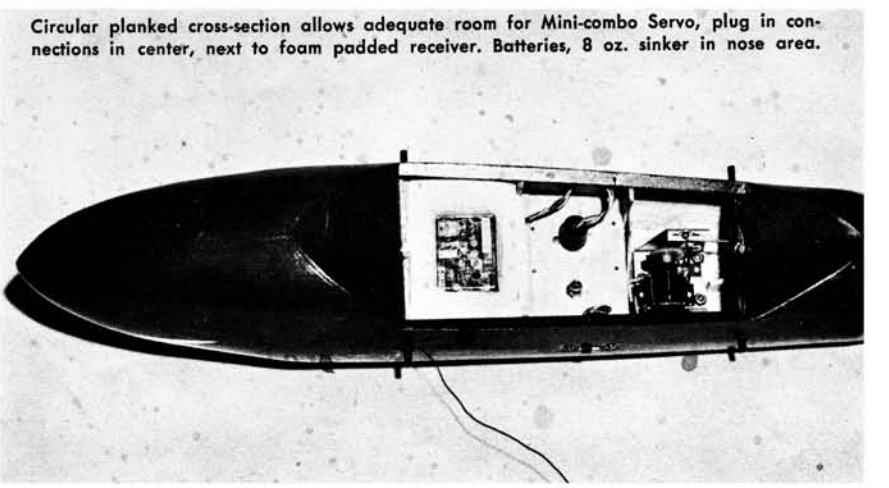
A word about power: Planes of this type require very little oomph in comparison with the more conventional types. Over the past years, we have been using .049's for Thermic 72's (350 square in.) and .09 diesels to .15 glos for Thermic 100's. The "Sea Gull" carries 770 square inches of wing area, and is overpowered with a glo .15. I think any of the .09 diesels would be entirely adequate. We happen to have a mess of O.K. .15's, which we have been using right along with the intakes plugged, reducing power to 8000 r.p.m. with a 9/4. Long stroke motors swinging a large prop are best suited to this design, as high speed and small high pitched props, way up above the wing, cater to that "old devil" torque. Choose a motor with a radial mount or use one of the Tatone adapters, as it makes for easier adjusting and a slimmer pod.

Now let's get down to an evening's (?) work.

Fuselage: Lay out and cut the profile, as this will be your working

(*Continued on Page* 31)





Circular planked cross-section allows adequate room for Mini-combo Servo, plug in connections in center, next to foam padded receiver. Batteries, 8 oz. sinker in nose area.

SEA GULL

(*Continued from Page* 10)

board. All the formers are true circles and are drawn off with a compass. If you are giing to use proportional capement, "hollow" the formers now. If you are going to use proportional or a servo, just stack all the formers from the training edge of the wing aft, and drill a ¼" hole just off center. Before cementing the formers in place, be sure to cut off the tops of the formers at wing seat locations. They can be lightly re-cemented in place while planking. The fuselage is built in the old style; formers are cemented on both sides of the profile; stringers and planking are added to alternate sides, so that there can't possibly be any warps. If available, use spruce or pine for the stringers.

We're all in favor of the Berkeley rounded edge planking. It saves time. As you plank up to the point where the wing seat is cut, lay in a strip of ⅛" x ¼" hardwood flush with the edges. This will serve as a wing mount and also as a cutting line later. The block is cemented in after you have carefully sighted through the formers for the pushrod or torque rod opening. This is infinitely easier than blind holes in the block after it's covered (we know!)

Although we originally hollowed out the nose block, it would be wiser to leave it solid, but be sure to bury in eight ounces of dead weight, (fishing sinkers are fine) before cementing the two halves together. After the fuselage has been fine-sanded and allowed to age (it's not Scotch, 24 hours will do), you can cut off the wing seat, but go very slowly, as you'll need this entire assembly for a wing fairing. Be absolutely sure that you obtain the wing incidence shown on the plans.

Using ⅛" sheet, inlay a floor for your equipment. Try to avoid chopping away too much of the former material, but if you find that you must, using the old finger painting technique, rub a coat of cement on the inside of the planking. We do this as a matter of course, but it's really not required if the planking is reasonably well supported. If you don't dope the tail surfaces too heavily, the normal compliment of batteries (6 pen cells) will balance the ship out nicely, but we must confess to putting a rather heavy finish on the original, and since we needed the weight, we used two battery boxes, wired in parallel. This turned out to be a bonus at the field, as we rarely had to switch batteries. Be sure to tightly pack the battery compartment with foam, or on rough landings and other "mistakes," the batteries will make their own hatch.

Wing: The wing is sparless and built entirely of 1/16" sheet, with the exception of the leading edge. This is an extremely strong, warp resistant, and light structure. Despite several crackups, the wing has never shown anything but surface damage. Incidentally, the only real damage we ever had, occurred when we stuffed the wing crosswise in flying buddy, Ken Sherman's Volkswagon. As we went over 35 m.p.h. the wing section, hanging out the window, demonstrated its lifting ability all too well. No, the car didn't leave the ground, just the last 22" of wing. Vive station wagons!

The building technique is quite simple. On each panel, pin down the bottom leading edge—trailing edge sheets, capstrips, fill-in panels, and leading edge. Cement the ribs in place. Sheet the top leading edge and permit to dry overnight. Remove all pins going directly into the building board; sheet the trailing edge and add capstrips.

One of the simplest ways of making ribs is to cut a 1/16" ply pattern of the root rib for a guide. As you get into the tapered section, merely swing the top of the trailing edge down to the length required for each rib. Strong simple dihedral joints require only a few closely spaced ribs, careful flush sanding, a complete wrap-around with 2" gauze, and six coats of cement feathered on (just like a hand launch glider.) We would advise imbedding a 2" length of 1/16" diameter wire where the rubber holddowns cross the leading and trailing edges.

Now sand the entire wing smooth and you're ready for the one ticklish job—the wing fairing. The simplest way to handle this is to lay waxed paper across the entire wing saddle, including the angled formers. Pin the wing in place, add the filler formers, and plank as you did the fuselage. You can, of course, use the piece previously cut out of the fuselage, but this does require a lot of blind trimming, After this assembly has dried, lift off the wing and remove the waxed paper. Be sure that the fit is free so that the wing can pop off easily.

Stabilizer: Construction is exactly the same as the wing. If you can, pick soft to medium balsa, as there is no stress on this unit.

Rudder & Fin: Use soft wood, but be sure to face the leading edge with hardwood or rock hard balsa. Do not leave the fin solid as it is an invitation to warps. Use very hard balsa for the ribs and inlay them at least ⅛" at leading and trailing edges. Personally, we have never cared for cloth hinges, and have found that the tubing and wire type never wears out and has no play. Sewn Figure-8 hinges were used on one version and are O.K. if you don't get any dope on them. Do not forget to notch plywood for a horn support.

Power Pod: Use the following building sequence: Cut two blocks for the pod mount and precoat with epoxy resin or weldwood. Cement the blocks together without the mount. After blind nuts are mounted on the firewall, epoxy the firewall to the pod block, then carve and sand to shape. Saturate the slot in the pod with cement and force in the pod mount. Drill holes through the wing fairing and wing and cut a slot for the pod mount, then saturate the slot with cement and force in the pod mount. Check the entire setup for accuracy before the cement is dry. The firewall face must be at 90° to the wing. Shim if necessary. After this assembly has dried for at least 24 hours, gauze all the joints (especially the firewall) and feather on at least six coats of fuel-proof cement or two coats of epoxy resin.

Finishing: All wood which will come in contact with the covering should receive two coats of clear and a fine sanding. A good grade of colored silk should be used on the entire ship. The color can be heightened somewhat by cutting in 20% color dope to the clear. Note: Blend the color dope 50% with thinner before adding to clear.

The entire ship should now receive five to eight coats of clear. Give the motor pod and the center of the wing an additional three coats. A Celastex or fibre-glass strip on the bottom of the fuselage, running right up to the tip of the nose, will discourage pebble catching. It is most important that the wing be balanced. An extra coat or two of dope on the lighter tip should do it. We have always found red and orange to be the best "visibility" colors. The "Sea Gull" in the pictures is trimmed in white, but go easy, as color dope is quite heavy. Steam out any warps you may have picked up within 24 hours of final doping.

Equipment: Since the "Sea Gull" has carried two pounds of payload with complete ease, you can use any radio equipment on the market today. The very first versions used a

single channel receiver with both Babcock and Bonner compound escapements. This arrangement was fine, providing one of the large ground transmitters, such as the Gyro, was used. Several of the hand-held types were tried, which didn't seem to have quite enough range.

The present version is using a C&S outfit, with a Minicombo No. 2 servo. This setup is really sweet, as the servo is quite powerful and you don't have to mess with rubber. An Orbit 4 channel unit worked well also, with a single Bonner servo for the rudder, and an Annco (tucked in the wing fairing) for the motor. Of course, there is a weight and price penalty when using multi, but I wanted to try motor control.

Actually, for 90% of the flying, we just use the motor to get enough altitude for soaring, so we don't feel motor control is particularly important on this type model. A Veco clunk tank strapped to the side of the motor pod mount is just the ticket, as you can see how much fuel you have on board. For the .15's, ¼ ounce of fuel will get you up about as high as you want to go. However, for a perfectionist, a small tank buried in the motor pod, and a Tatone modified D. T. Timer would be neater in appearance.

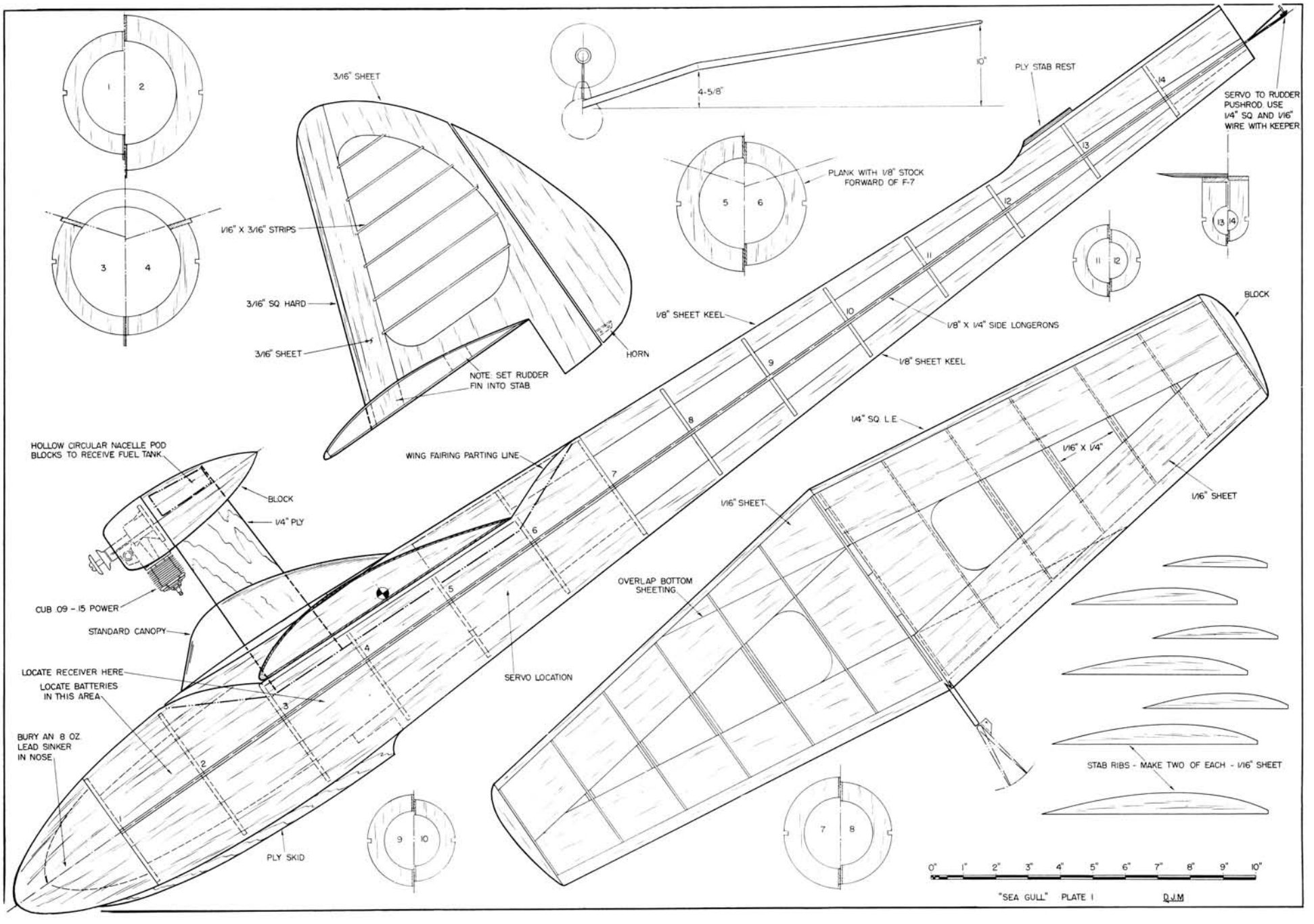
Flying: Test glides should be made from a height of at least twelve feet. Heave the ship as hard as you can with the nose pointed slightly down. A slightly mushy condition is O.K., but a stall should not be accepted. You can add up to ⅛" packing under the leading edge of the stabilizer. If she still stalls, add weight. When in doubt, you're off with a forward C.G. setting and a lot of decalage. Do not tolerate less than 3° as this will not permit you to circle tightly. I found a 35% C.G. with a plus 4° wing setting ideal.

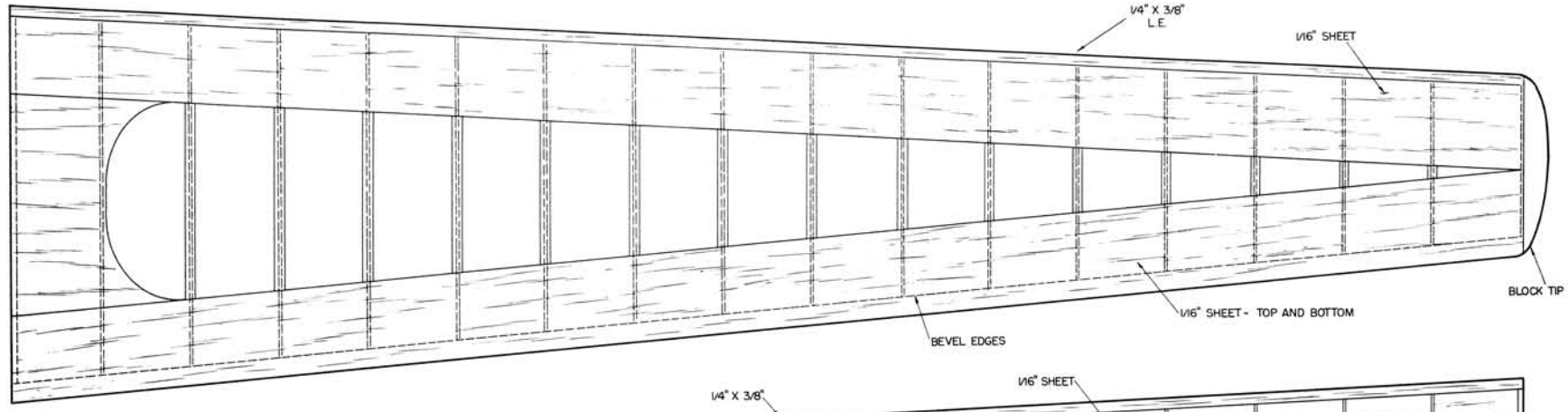
First power flights should be made with ¾ power, transmitter handy, and nothing more than a 10 m.p.h. wind. The motor will require approximately 3° right thrust. On test flights, make all the power turns to the right until she picks up lift, hunting for 200'. Adjust so that under power she flies very fast and flat. Trim the glide so that she hangs back slightly with just a trace of "mush."

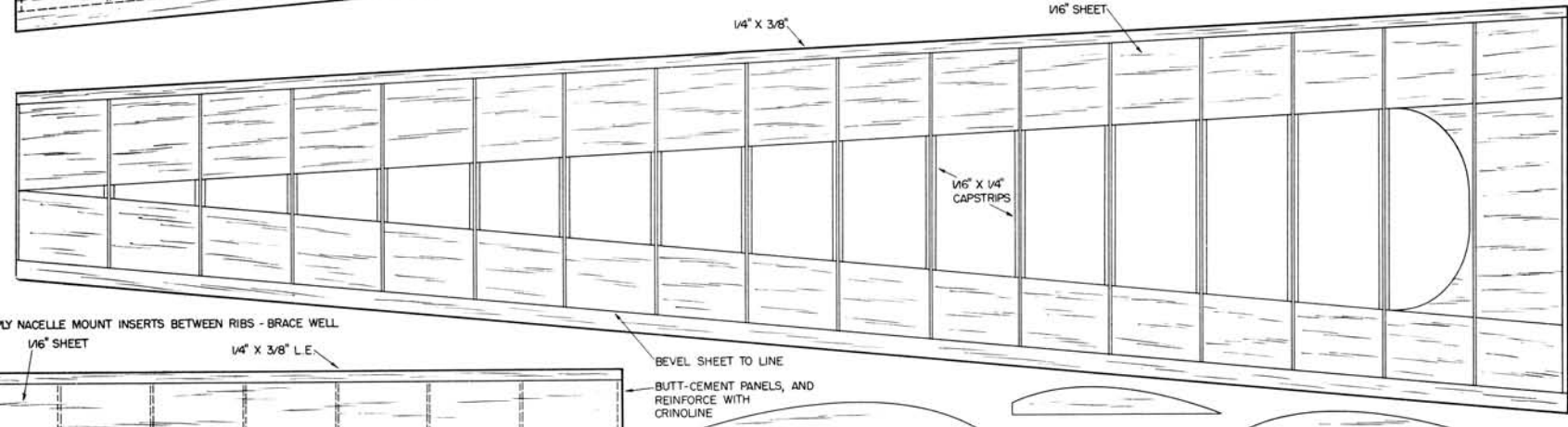
Here then, is the heart of the matter. Under power, the "Sea Gull" should climb in very wide circles, going upwind all the time. When the motor cuts, she drifts into a large sweeping pattern, running crosswind until she picks up lift. Hunting for thermals, there are two things to look for—rocking wing tips and a jerky, crabbing motion. The "Sea Gull" will hold tight, smooth circles in thermals. Should she at any time show a tendency to dive or fall off in these tight turns, retrim for a mushier glide. Sometimes the wings seem to be completely vertical through ¾ of a turn. That's the way we like it.

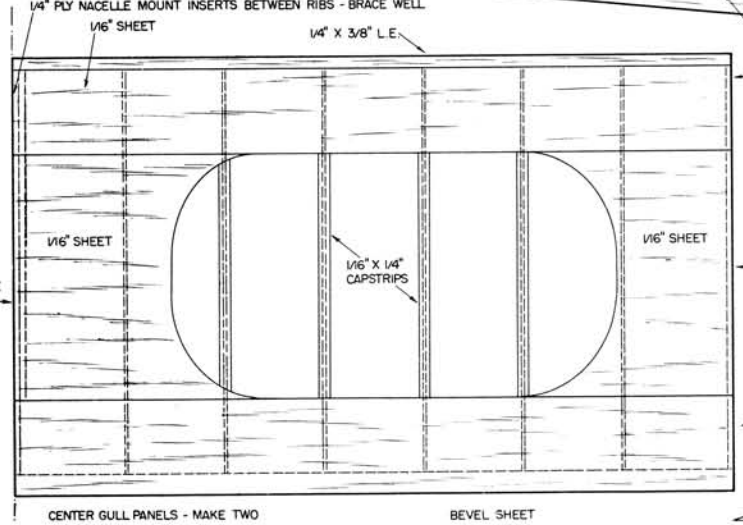
For soaring over slopes, cliffs, sea walls, or concrete runways, she must be trimmed for a very fast, flat glide to punch into lifting air. The general pattern for this type of flying is to tack much like a sailboat at 30° or so, alternately to the left and right of wind direction.

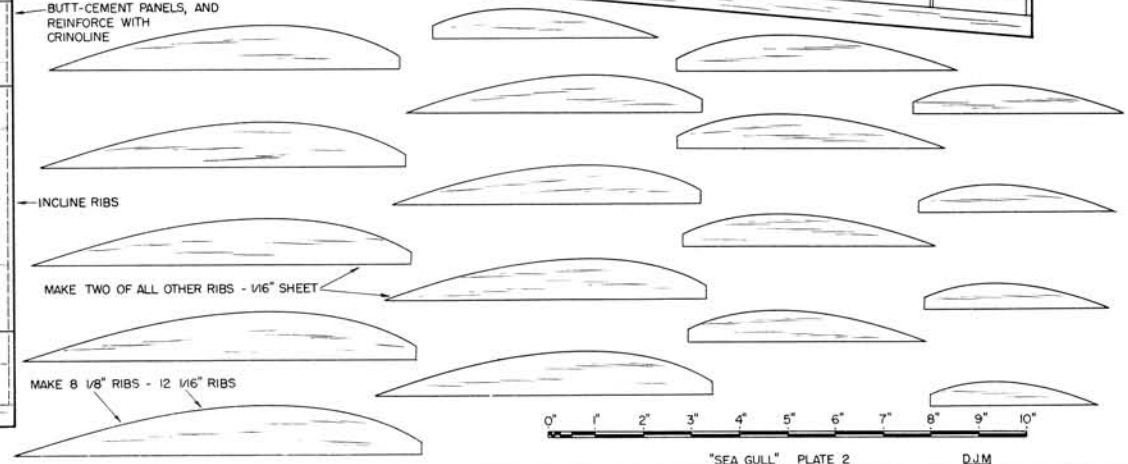
The name "Sea Gull" does not derive from the author's surname, but from the bird which we hope yours, will emulate. Happy glider flying! ●


3/16" SHEET
4-5/8"
10"
PLY STAB REST
SERVO TO RUDDER PUSHROD. USE 1/4" SQ. AND 1/16" WIRE WITH KEEPER
PLANK WITH 1/8" STOCK FORWARD OF F-7
1/16" X 3/16" STRIPS
3/16" SQ. HARD
3/16" SHEET
HORN
NOTE: SET RUDDER FIN INTO STAB.
1/8" SHEET KEEL
1/8" X 1/4" SIDE LONGERONS
1/8" SHEET KEEL
BLOCK
1/4" SQ. L.E.
1/16" X 1/4"
1/16" SHEET
HOLLOW CIRCULAR NACELLE POD BLOCKS TO RECEIVE FUEL TANK
WING FAIRING PARTING LINE
BLOCK
1/4" PLY
1/16" SHEET
OVERLAP BOTTOM SHEETING
CUB .09 - .15 POWER
STANDARD CANOPY
LOCATE RECEIVER HERE
LOCATE BATTERIES IN THIS AREA
SERVO LOCATION
BURY AN 8 OZ. LEAD SINKER IN NOSE
PLY SKID
STAB RIBS - MAKE TWO OF EACH - 1/16" SHEET
0" 1" 2" 3" 4" 5" 6" 7" 8" 9" 10"
"SEA GULL" PLATE I
D.J.M









"SEA GULL" PLATE 2 D.J.M.