

The engine nacelles. A work of art, fibreglass.



Two Enya .60's turns the lake to froth... you just haven't lived until you try an R/C Scale Twin-Engined Amphibian.



Oscar Weingart's

Grumman "WIDGEON"



Brimfield, May '68: Porpoised with excessive power on take-off in rough water, dunked over. Later flights with twin Enya .60's, retarded for take-off worked better. It takes a little technique to plane-off a flying boat, which a few high-speed taxi runs will teach you. This ship is tremendous in the air with Enya's wide.

◆ The story of this model goes back to the summer of 1966. My family was vacationing on Cape Cod. We arrived late on a Saturday night and checked in to our cottage. Next morning, I stepped out on the beach. There was a beautiful sight—a cove, about a half mile across, which looked like a small

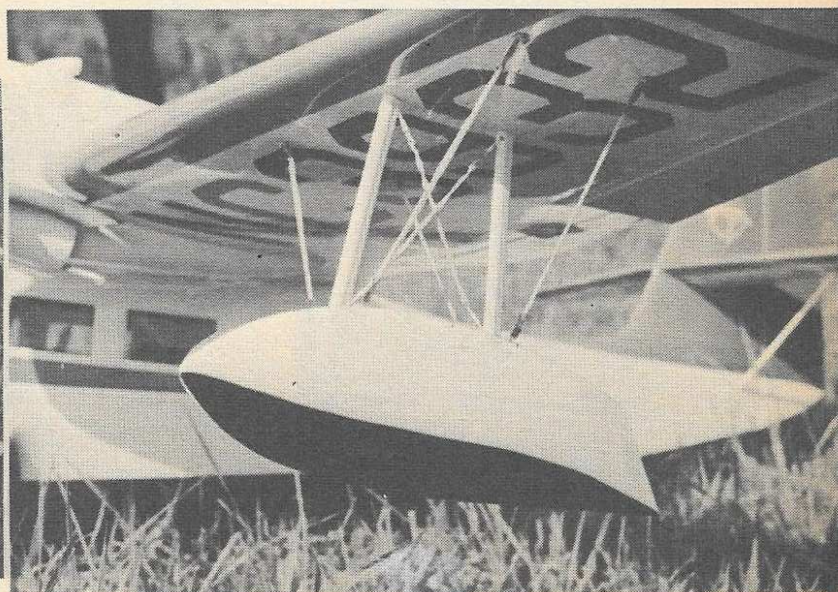
round lake. The water was a mirror in the dead calm air. "Why didn't I build a floatplane," I cursed, "or at least an R.C. boat," I raged. A modeler's instincts to pursue his hobby seem to be sharpened when away from home. That summer I had to settle for learning to sail. Don McGovern's articles

FULL SIZE PLANS AVAILABLE THROUGH "MODEL PLAN SERVICE"

Oscar's mad project was test flown the night before the D.C.R.C. Symposium, was off the lake in seconds, all over the sky with engines synched. B&N Custom fitted Mufflers on this, or you'll shake up the whole world.



At the D.C.R.C. Symposium. Not flown here for lack of water. Flew first flight night before.



Close-up of a wing float, works to perfection.



Wing floats are shock mounted with rubber rigging. Scale amphibians are tough, require more in power than Privateer types, due to wheels and the bulk of fuselage, heavier loading and such.



You can cut way down on power, takes off best with engines retarded, twin .45's should be a good way to go. Keep light for .35's. It is a very beautiful, inspiring bird. Live it up, build six.

... continued ... "WIDGEON"



On the beach: Oscar and his beautiful Widgeon. It is a ship for an experienced flyer to test.

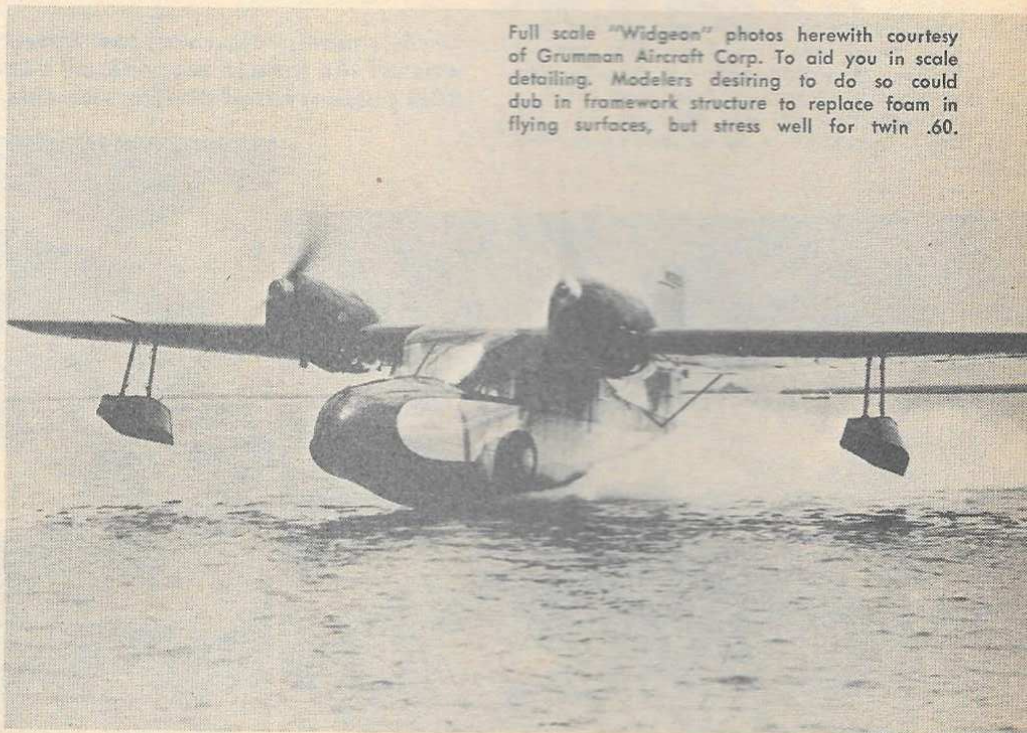
and "All Wet" column only made it worse.

As soon as I got home, I ordered a set of Gee-Bee floats and stuck them on my V-K "Cherokee". The ship flew beautifully and I can remember no greater modeling thrill than the first successful water take-off. Don described this ship in the "All Wet" column of Flying Models. After many fun flights and splashes, the "Cherokee" finally bit the concrete at Mitchell Field, but not before inspiring some of the LIDS to try hydro-flying.

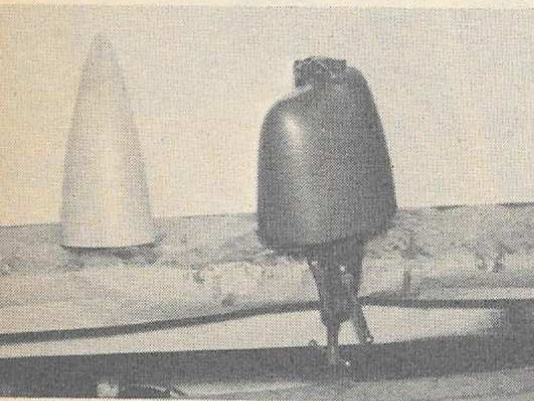
My next hydro ship was a Lanier "Bronco" with the same Gee-Bee floats. I flew this ship at the 1967 Brimfield

and Suffolk Falcons' meets. At the Suffolk Falcons' meet, I won three prizes, which I attribute to proportional radio gear and lack of competition. These were the first places I ever won at an R.C. contest. Again this ship was retired after a bout with solid ground, but I still have the floats! It is amazing how much punishment a model airplane can take, as long as it crashes only in the water. Incidentally, I flew hydro during my 1967 vacation. The "Bronco" was the first thing packed and was flown and splashed at Echo Lake in the Poconos.

What does this have to do with the
(Continued on Page 34)



Full scale "Widgeon" photos herewith courtesy of Grumman Aircraft Corp. To aid you in scale detailing. Modelers desiring to do so could dub in framework structure to replace foam in flying surfaces, but stress well for twin .60.

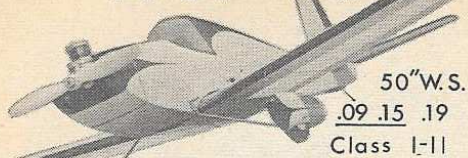


Hobbypoxy balloon method

The Balloon method molds the fibreglass cowls.

Weingart's Wet Wild wonderful Widgeon Works With Wings, Wheels, Water, Waves!

Mister E



50" W.S.
.09 .15 .19
Class I-II

DELUXE PRE FAB

kit (less wheel covers) \$14.95



CIRRUS
Plans \$2.00

FULL SIZE PLANS
73" W.S.
Powered
By Towline

Send Stamp For Plan List

Special Edition Plans
Box 2555 Schenectady, N.Y. 12309

"WIDGEON"

(Continued from Page 12)

"Widgeon" you ask; Well, once bitten by the waterbug you never recover. Like many modelers my first love is scale. I had been doing research on a "P-38" for two years, to be built if I ever learned to fly. But in March, 1967, after I had already been bitten, American Modeler printed an article, with 3-view, on the Grumman "Widgeon." That did it! Who could resist? Here was my ideal—a twin engined scale job that could be flown off land or water! The "P-38" was hastily set aside and research begun on the "Widgeon."

The first move was to send for a copy of the original 3-view, which was twice the size as that in the magazine and hence easier to scale up. You can get a set for \$1.50 from Paul R. Matt, Historical Aviation Album, P.O. Box 33, Temple City, Calif. 91780. I recommend the American Modeler Article and Volume V of the Historical Aviation Album for scale detail, color schemes and markings. My ship was white with red trim and black markings. Areas below the water lines are also black. The Grumman Public Relations Department provided a set of six 8½" x 11" glossy prints of "Widgeons" in various markings and attitudes. These can be obtained cost-free from

Grumman Aircraft Engineering Co., Public Relations Department, Bethpage, Long Island, New York.

At the time I was considering retractable landing gear, so I wanted more detail on the mechanism. Grumman's P.R. people couldn't furnish this, so I had to see a full scale ship. Float and seaplane flying has diminished in the New York area and Grumman ceased "Widgeon" production in 1949, so finding one turned out to be a problem. Finally, a co-worker, Tully Adler, who is an old-time model builder and lightplane pilot, spotted a "Widgeon" at Teterboro Airport. A few weeks later, on the way to a Cousins' Club meeting in Teaneck, my wife and I stopped off at Teterboro. We drove along the apron, for miles, it seemed. The planes got older and more unkempt as we drove along toward the north end of the field. It was like travelling backwards in time. It was getting dark. Finally, just as we were about to give up and turn back, there it was! Tully had been right.

The ship looked like a World War II surplus model. It was dirty and had a horrible purple and yellow color scheme. Someone had rigged a wooden bow platform over the front hatch. Since it was getting dark rapidly, I shot off a roll of 35mm color, half with flash, while my poor wife fought the rapidly emerging swarms of mosquitoes. Most of these slides came out and they were valuable in getting detail not shown clearly on other pictures or plans, although I finally dropped the retracting gear (pun).

Additional pictures and data can be obtained from the book "Flying Boats" which is volume five of the series "War Planes of the Second World War" by William Green (Doubleday, 1962). I called Don McGovern and he advised against the "Widgeon" because of its stubbornness. Don suggested the PBY "Catalina" with its longer hull and big wing, but that had been done. He also suggested leaving in the scale up-thrust.

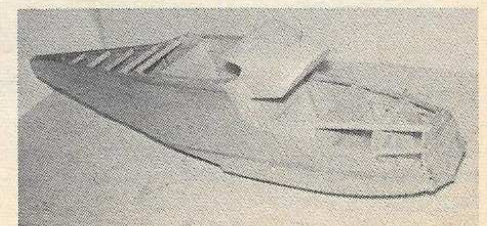
I kicked around the scale to use for some time. There were many governing factors, such as being able to completely enclose the engines in the scale

Ranger cowlings; a reasonable wing area, without an unreasonably big hull; the size of my station wagon, which dictated a wingspan no greater than six feet; the size of my drawing board, which meant limiting the hull to 60" length; the cost of balsa wood; the AMA 15 lb. rule; the 1.25 cubic inch rule and so on. Also hopefully, the ship should be able to fly with two .29 engines at 10 lbs., so a lightly built one could compete in the FAI R.C. scale event. I tried making a chart of various critical dimensions at various scales to see which looked most reasonable. This is reproduced below:

| Scale | 1½"=1' | 1¾"=1' | 2"=1' |
|------------------|--------|--------|-------|
| Wingspan | 60" | 70" | 80" |
| Length | 47.2" | 55" | 62.8" |
| Max. Wing Chord | 11" | 12.8" | 14.6" |
| Wing Area | 560 | 760 | 1000 |
| Fuse Max. Width | 6¾" | 7¼" | 8½" |
| Fuse Max. Depth | 10.1" | 11.8" | 13.5" |
| Wheel Dia. | 3" | 3½" | 4" |
| Spinner Dia. | 1½" | 1¾" | 2" |
| Scale Prop Dia. | 10½" | 12¼" | 14" |
| Wheel Spacing | 11½" | 13.6" | 15.5" |
| Nacelle | 14.3" | 16.7" | 19" |
| Engine Clearance | 3" | 3½" | 4" |

I selected the 1¾"=1' size as being the best compromise. The span and area seemed adequate, since twin float jobs with this area at 10 lbs. took off easily with only one muffled .60. To get extra scale points and aid in take-offs if necessary, it was decided to use operating flaps. Two Enya .60's fit neatly into the cowlings and there was room for 10 oz. tanks. Logictrol II seven channel gear allowed flaps and also possibly retractable gears and brakes. Another possibility was independent throttles, to give scale-like taxiing. The full scale ship had no water rudder, and was helped in turn-

(Continued on Page 36)



Fuselage structure, assembles easily, of balsa.

BUYING RADIO?

read this book first



Explains each type of R.C., what units will work together, what control can be obtained with each, amount of interference. Not a duplicate of other books. \$1.00 at shops or

MODEL CRAFT

2304 Redondo Beach Blvd., Gardena, Calif.

"WIDGEON"

(Continued from Page 34)

ing on water by jockeying the throttles.

Next I had to decide on construction methods. The full scale ship had fabric covered control surfaces and outer wing panels. This can easily be simulated by standard rib and silk construction. I decided to go a different route in order to save labor and give a stronger and more waterproof airplane. R. C. (Dick) Aggers of Autocon Corp. had given a demonstration of his Marvelite covered foam wings at one of the LIDS meetings. He had mentioned that he made custom wings in addition to the popular standards. I called Dick and was able to interest him in the project. Dick cut the foam cores from my templates, and I installed spars and controls and cut-out and framed the flaps and ailerons. I returned the finished cores to Dick who then put on the Marvelite. Those interested in building the ship can purchase the cores from Dick. Write to him at Autocon Corp., 250 Orchard Rd., East Patchogue, L.I., N.Y. 11772. The tip floats were likewise made of foam and Marvelite, although these were hand carved out of solid foam and covered with Marvelite by myself.

I have been in the reinforced plastics industry since 1954, but like the proverbial shoemaker whose children go barefoot, I had never used a bit of fiberglass or resin in any of my models. The "Widgeon" engine nacelles seemed like a good place to start. Here were two identical shapes which had to be hollow and had all kinds of compound curves. Fiberglass seemed a natural. I carved a solid nacelle out of about \$50 worth of block balsa and broke it up into four sections which could be easily molded by the Hobbyoxy balloon method. These were the front cowl, upper nacelle lower cowl and lower nacelle. I still have the molds, and will arrange to furnish you with nacelle parts or loan you the molds if you will write me at: 251 Cedar Road, East Northport, N.Y. 11731.

The original ship had external mufflers.

Since we are required to use mufflers at most local flying sites, it was decided to simulate the scale mufflers. The Enya exhaust is on the wrong side, so our nacelles are partially mirror images of those on the real ship. The Enya muffler looks nothing like the real muffler, so I posed the problem to Norm Rosenstock of B&N Model Accessory Company. Norm is an old friend and fellow LIDS member. He came up with a pair of his standard mufflers which had long extension exhaust pipes shaped to resemble the real ones and curved to exit below the wing as on the full scale ship. He shortened the manifold adapter so that the mufflers recess into the cowl in a realistic manner. While they are quite a bit larger than the scale mufflers, the overall effect is quite pleasing, realistic and definitely at least semi-



scale. If you are building the ship, I am sure Norm will help you with the mufflers. Drop him a line at: B&N Model Accessory Co., 94 Cedar Drive, Plainview, N.Y.

I am also indebted to LIDS member Wally Kranz, a Grumman inspector, who got me the decals for the Grumman logo on the vertical fin.

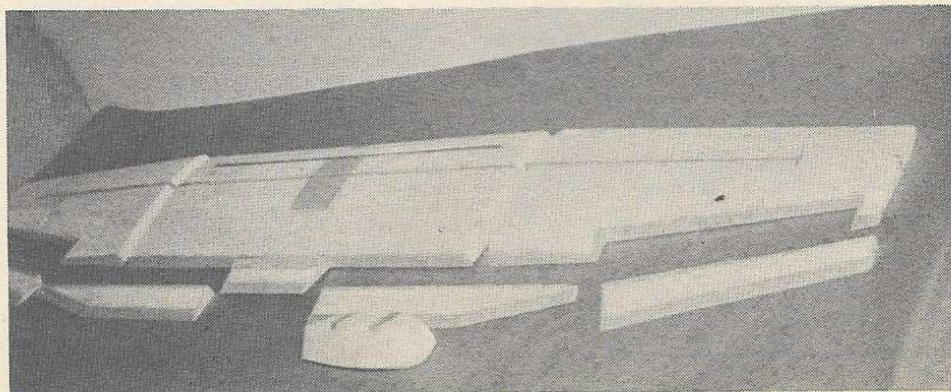
The fuselage and tail surfaces were built with standard sheet balsa construction. A minimum of $\frac{1}{8}$ " sheet thickness was used throughout. There is nothing more sickening than to have a fuselage side buckle due to inadequate stiffness because you started with $\frac{1}{16}$ " which you sanded to $\frac{1}{32}$ " before you started doping it. All flat fuselage panels and sharp corners were stiffened with $\frac{1}{4}$ " square framing. Bulkheads and doublers were $\frac{1}{4}$ " medium sheet. The forward bottom section of the hull was fiberglassed, since this section on a seaplane takes mucho pounding, including possible beach or grass landings. This ship could have been made at least two pounds lighter by stepping all wood sizes down a notch ($\frac{1}{8}$ " becomes $\frac{3}{32}$ " etc.) but I wouldn't advise it. It is not a stunt job and it flies quite well at 13 lbs. (and it is strong). Conventional wing and control surface construction would also lighten the plane, in addition to coming closer to scale. This could be done if you want to fool around with cockpit detailing, retracting gear, and so on, and still stay below 15 lbs. With the lighter radio gear now available, and the other lightening moves de-

scribed above, even a 10 lb. airplane with two .29's seems feasible.

The compromise landing gear finally decided on was a fixed (but steerable) tailwheel and "plug in" main gears. For water flying the gears are unplugged and the $3\frac{1}{2}$ " Veco airwheels are bolted into the wheel wells for scale appearance and flotation. The tailwheel may be replaced by a water rudder, which is not scale, but allows for more precise steering at low water taxiing speeds. I think that a workable retracting gear could be designed by using scale-type parallelogram "A" frames (like the front suspension of a car) with "Posittract" worm screw units to do the retracting. Picture taxiing down the beach into the water, retracting the gears and taking off. Too much!

When you start the detailed work of converting an airplane into a flying model, you get more familiar with the airplane than you would upon casual inspection of a 3-view. The layout of the "Widgeon" gave me a healthy respect for full scale designers, especially considering that the design is 30 years old. The stabilizer is well up on the fin, getting it out of the waves on takeoff. This location also puts it in the prop blast, which makes it more effective. The steep angle back of the step allows plenty of rotation for takeoff. The high wing and thrust lines gave plenty of prop clearance and the location of the props forward of the windshield allowed close-in thrust line

(Continued on Page 38)



70" in span, foam-laminated wing suggested.

B&N MUFFLERS

MINIMUM POWER LOSS • EFFECTIVE SILENCING



23 Available Models

to fit all popular engines

\$10.00 POST PAID or YOUR LOCAL DEALER

One year warranty against manufacturing defects

write for FREE brochure

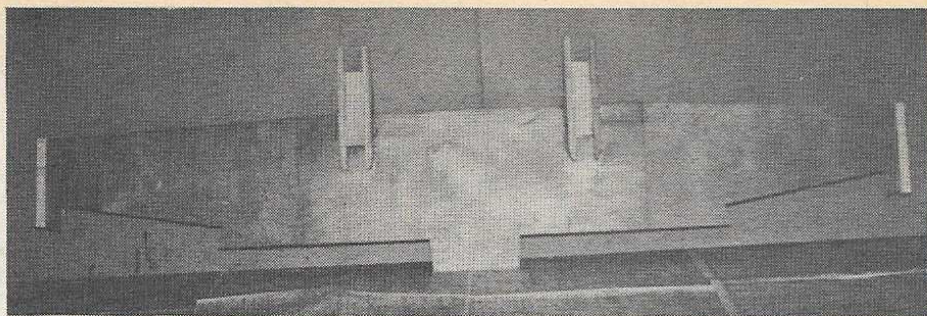
B&N MODEL ACCESSORY CO.

94 Cedar Dr., Plainview, N. Y.

"WIDGEON"

(Continued from Page 36)

location, since the props could swing in the extra space available at the smaller nose cross-section forward of the windshield. The landing gear design allowed short struts for good strength and the nose falls away enough for good visibility during ground taxiing. The simple rectangular hull cross-section allows easy model construction, and undoubtedly allowed easy full scale construction also. The main entry door is high up to keep water out and the bow hatch allowed easy entry from a dock and ease of mooring. The tip floats also had slab sides which make for simple construction. Like many scale models, the original ship was somewhat underpowered, and later conversions went from the 200 hp Rangers to 250 hp and even 300 hp engines. One thing about model seaplane flying we learned the hard way is that you can't have too much power. You can always throttle back if you don't need it. My model cruises nicely



Nacelles mounted on wing. Marvelite capping.

at $\frac{1}{4}$ throttle, and takes off from water at $\frac{1}{2}$ throttle in a no-nonsense, reliable way.

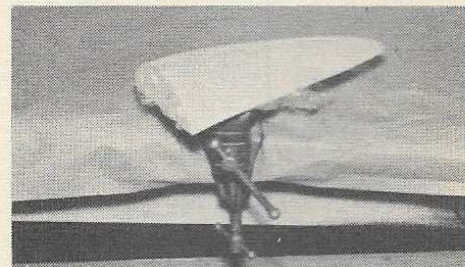
If you are a beginning modeler and want to build this ship, forget it. For the rest of you experts, I will cover the highlights of construction. Most construction articles I have read make it sound like the ship should be built up exactly according to plan. I am a senior mechanical engineer, but I have to admit that I made plenty of mistakes. The plans were constantly being revised to reflect changes made during construction. I will discuss some of these errors as we come to them. Those other guys must be smarter, I guess.

Wing: Cut out the flaps and ailerons with a razor saw or hot wire. Trim the foam and epoxy on the $\frac{1}{8}$ " flap and control surface outline framing and the trailing edges. Put in the bellcranks and Nyrods for engine throttle and ailerons. Frame in the servo compartments with $\frac{1}{8}$ " balsa. Next put the clevis from a Quick-Link on each bellcrank so that a pushrod can be fished into it later after covering. I put a couple of extra spars between engines, but now I think they weren't needed, the two $\frac{1}{4}$ " x $\frac{3}{8}$ " spars should be adequate, and even these could be left out if fiberglass is used at the outer panel joints. Put in the anchors for the wing floats and plug the blind nuts with wax to keep the glue out. Cover all slots and openings with balsa and sand smooth. Don't forget the hardwood inserts for the wing hold-down dowel and screws. Check for lumps and cover the cores with Marvelite or what you will. Use epoxy around the trailing edges. Splice the outer panels to the center with the top flat. Use epoxy and fiberglass the joint afterwards. I used spar splices and dowels rather than fiberglass to avoid the lump at the joint. The fiberglass splice without spars will make a lighter wing. Cut out the bottom skin at the servo compartment and cut away the leading edge for the engine mounts. Cut out top

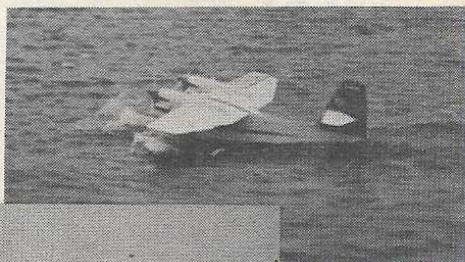
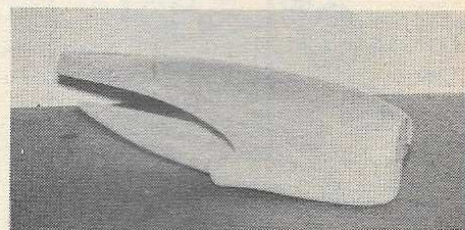
skin for the aileron pushrods (real ship has pushrods on top) and fit pushrod fairings. Put on the balsa wing tips, hinge control surfaces and remove for painting. Clean out the holes for tip float mounting. Set the wing aside for a while.

Engine Nacelles: Make the eight moldings for the nacelles by the Hobbyoxo balloon method. I used three layers of number 120 glass cloth with a Volan-A finish, which molds to a total wall about .015. I used Shell Epon 826 resin with 10 parts per hundred (by weight) of diethylene triamine catalyst.

Fabricate the hardwood and plywood motor mount boxes and epoxy onto the wing. Put on the balsa formers and epoxy the nacelle parts in
(Continued on Page 49)



The smooth balsa cowling form mounted on vise.



FM9



Please Send

to..... name

..... address

city..... zone

state

12 ISSUES FOR \$5.00

(Canada and elsewhere \$5.60)

Give to your newsdealer or mail to:

FLYING MODELS

215 Park Av. So., N. Y., N. Y. 10003

INDEX TO ADVERTISERS — SEPT., 1968

| | | | |
|-----------------------------|----------------|------------------------------|-----------|
| America's Hobby Center | 5, 6, 7, 9, 37 | Heathkit | 31 |
| Andrews Aircraft Model Co. | 50 | Major Model & Mfg. Co. | 41 |
| Balsa Corp. of America | 41 | Midwest Products | 43 |
| B&N Mufflers | 38 | Modelcraft | 36 |
| C&H Sales | 49 | Model Plan Service | 35 |
| Camping Guide Subscriptions | 46 | Models A-Z | 42 |
| Centuri | 43 | U.S. Navy | 49 |
| Classified Ads | 48 | Special Edition Plans | 36 |
| Estes Industries | 45 | Sterling Models | 26, 27 |
| Flying Models Back Issues | 3rd Cover | Tatone Products | 47 |
| Flying Models Subscriptions | 38 | Top Flite | 4th Cover |
| Grish Brothers | 3 | Trailing Guide Subscriptions | 40 |
| Paul K. Guillow | 39 | Verdell Instrument | 50 |
| Hall Company | 33 | Volkswagen Owners Guide | 44 |
| | | Wargotoons | 47 |

"WIDGEON"

(Continued from Page 38)

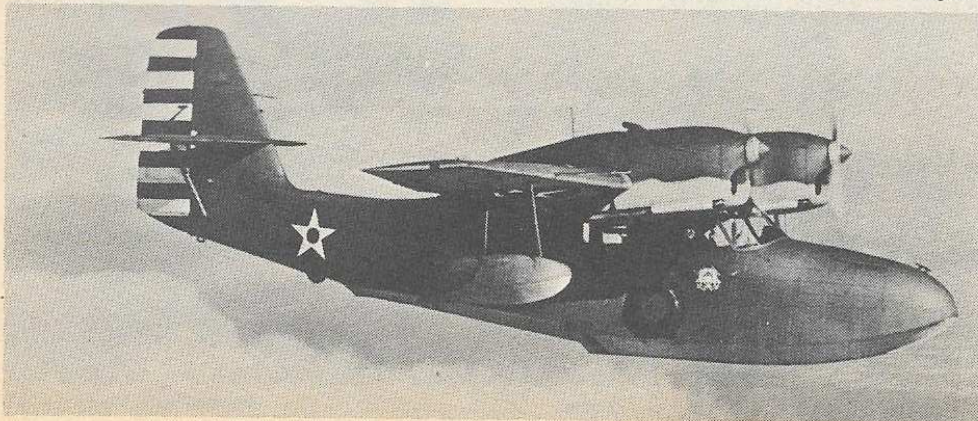
place. Get a good fillet of epoxy at the transition between nacelle and wing. Fair and blend all points with "Stuff." Epoxy on the hardwood anchor blocks for cowl mounting and mount engines and tanks temporarily so the various access holes can be cut. Now remove engines and cowls. The wing-nacelle assembly is now ready for painting.

Tip Floats: These were carved out of 1 lb. per cubic foot dylite foam. Fit a balsa nose block and a hardwood trailing edge, then epoxy in the hardwood strut mountings. Sand smooth and cover with Marvelite or your favorite skin material. Be sure to fill the blind nut holes with wax prior to covering. The aluminum struts are made from 9/32" dia. aluminum tubing squashed in a hinge around an 1/8" dia. dowel to get the streamline shape. The expendable dowel goes into the float and wing for keying and the aluminum acts as a compression strut. Drill struts for the small fishline connectors. The floats can now be set aside. Be sure to dope your dowels so they don't swell up. Mine did and became hard to remove.

Tail: The vertical fin is built as part of the hull. The stab is conventional construction with 1/8" sheet covering. The rudder and elevators were carved from 1/2" dead soft balsa sheet. You may choose to build these up and silk

to simulate the cloth covered surfaces on the full scale ship.

Hull: We saved the best for last. The hull is conventional balsa construction, but strong. After you see a big seaplane hit the water on a less than perfect landing, you will understand why. Lay out the fuselage sides, using 1/4" square and 1/4" sheet. Build the left side on top of the right. You can put on the 1/8" sheet sides at this time on the left side. After drying, flip over and put on the right side sheeting. Watch out for the white glue used to splice wide sheets together. It is not waterproof. Separate the sides, cut out the wheel wells, and glue in the 3/32" ply wheel well reinforcements. Put in the two main 1/4" sheet bulkheads on either side of the main cabin. Carefully bend the front rear sides together and install the remaining bulkheads and cross-members. Put in the nose stringers and bend as much of the side sheeting around the nose curve as you can. I goofed in thinking I could make the 1/8" sheet conform to the compound curve of the nose. Trim off excess and plank the remainder. Put in the battery pack switch harness wiring and seal around the wires. I made a special harness which is left in the ship. Put on the nose block. Next epoxy in the 1/8" I.D. landing gear plug-in tubes and the 6-32 blind nuts. Glue on the stab, aligning carefully. Build up remainder of fin. Run in nyrods and Top Flite elevator horn. Put on top rear planking and fin fairing block. Put in the Nyrod



ELECTRONIC WAR SURPLUS

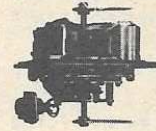
NT-6 WILLARD 6-VOLT STORAGE BATTERY



Rated 2.4 amp hr.
Approx. dimensions:
3 1/2" l. x 1 3/4" w. x 2 1/8" h.
Weight: 1 lb.
3 oz. (plastic case) Dry
charged.

PRICE \$2.50 each

R/C SERVO MOTOR DRIVE ACTUATOR



contains
2-6 volt permanent
magnet motors.
Current consumption
approx. 100 MA.
2-6 volt DPDT Relays
Many Gears

Unit completely enclosed in aluminum housing.

PRICE \$4.00 each

NICKEL CADMIUM BATTERY 1.2 VOLTS



rechargeable thousands of times
... alkaline storage battery sintered-plate ... flat voltage curve during discharge ... will hold charge for long period of time ... high discharge rate up to 50 amps ... spill-proof ... may be used in any position ... approx. 6 ampere hour capacity ... dimensions: 6" high; 2" wide; 1/2" thick ... Approx. wt.: 6 oz. ... uses potassium hydroxide (30% Electrolite).

PRICE \$1.95 each, postpaid

Approx. 10 amperehour capacity dim.: 4 1/2" high, 2 3/8" wide, 3/4" thick, approx. wt: 9 oz. \$2.95 postpaid

G & H SALES CO.

2174 EAST COLORADO ST.
PASADENA 8, CALIF. MURRAY 1-7393

NAVY



Fly with

THE BOLD ONES



the Sport master

For the R/C Modeler

A fully aerobatic plane for .45 to .61 designed for the new free-style **AEROBATICS**



\$38.95

Multi competition or sport

Wingspan _____ 65"
Length _____ 49"
Wing Area _____ 715 sq. in.



Featuring ... **BOX-LOK** Construction

also → **THE GREAT - AEROMASTER**
S-RAY and H-RAY

ANDREWS AIRCRAFT MODEL CO., INC. DANVERS, MASS.

for the tailwheel and frame in the tailwheel compartment. The 3/32" ply floor of this compartment has a 1/8" ply shim and blind nuts for attachment of the Top Flite tailwheel bracket. The shim allows an external horn. Along with the Nyrod, this makes a waterproof steerable tailwheel assembly, if you remember to put some glue on the screws when you attach the bracket. Now plank the bottom. Carve the nose to shape. Put in the cockpit floor. This prevents inundation if your windshield gets stove in. (It did.) Put on the top cockpit wing fairing block and the wing mount doublers and carve. You may hollow the block if you wish. Insert the 3/32" ply wing dowel seat in the fairing block. Put in the Dubro nylon nuts for the wing attachment bolts. Note that this makes a blind hole which won't leak. Then close in the aft wing seat and put on the fin sheeting. Frame the inner hatch with balsa. Hinge the elevators and rudder and remove for painting. Next, epoxy in the 1/32" aluminum spray rails. Cut out the bow hatch and frame the hatch seats. Put in the hardwood windshield struts. Cut out the windows. (You may decide to paint these on.)

Final Assembly and finishing: Carefully fit the wing into the wing seat. Install the 1/2" dowel and drill for the wing mount bolts. Fiberglass the bottom of the hull up to the first step. Paint the interiors of the bow hatch compartment and main cabin. Mount the servos and check control linkages. Finish the airframe according to your favorite method. I used MonoKote on the wing and tip floats and Hobbypoxy on the remainder. The receiver is put in a plastic bag, wrapped in foam rubber, put in another bag and then placed in a Dylite foam block with a Dylite cover taped on. This gives cushioning, waterproofing, and flotation. The tip floats are held on by rubber band rigging a la Nick Zirola, but this rigging is functional. If you hit a float too hard it will flip out, sometimes shearing the dowels. But the rigging keeps the float from falling off completely. The 10 oz. Pylon brand tanks fit snugly in the engine mount box. There is close clearance between the engine and tank, so you may have to do some fancy tube bending. I used Top Flite 11-8 nylons (don't use wood) and Royal 1-3/4" spinners. Naturally you can use any other good .35 to .60

engine in which you have a matched pair, but I love the Enya .60. Don't forget to make the plug-in landing gears. Also add the celluloid and plywood hatch covers. Silicone bathtub sealer makes a good gasket for the hatches.

Flying: Check the balance and add ballast until she balances at 25% of the main chord. I recommend test flying from fresh water, with a water rudder. If you goof, the water is more forgiving than concrete. Start the right engine, tune up, check idle speed (you can use a fast idle) and stop. Do the same with the left and then restart the right. If you hear a beat note the rpm's are close enough. Try some taxiing. Gradually add power until she starts to rise. Don't let it take off, but hold a little down elevator to get a faster water speed. (On the first flight she porpoised because the upthrust and wing incidence pulled her off before there is adequate speed to maintain flight.) Then pull back on the stick. This first water takeoff will be one of your greatest modeling thrills. My ship handled well in the air and required no major trim changes. Mr. Grumman knew what he was doing. Don't use the flaps on the first flight. After you get the feel of the ship, you can experiment with flap settings. The real ship used 15° for takeoff and 40° for landing.

For your first land flight, remove the wing tip floats. You may want to leave them off except for contest work. You may also want to make scale props and spinners for the judging. If you can use a pair of K&B's with smaller mufflers, you can come closer to scale on the nacelles. The full scale ship had lots of lumps and bumps and you can use your judgement on these. I put on the oil coolers (on the wrong side), the cowl vents and the stab struts. Some stuff such as the door outlines, can be put on with tape or a ruling pen. I also put on a scale bow mooring cleat, and this proved to be useful for anchoring and recovery towing. The external control counterweights were not put on. As I said before, you may want to detail the cockpit and landing gear. Go it it, you're a better man that I.

Happy Landings and I hope to see you at Brimfield. ●

the best performing engines are checked with an Original **FOWLER**

VIBRA-TAK

Only VIBRA-TAK gives jeweler's precision in a highly accurate tachometer... at a LOW price. Aluminum body, steel reed, deep-etched calibrations... readings up to 21,000 RPMs! Know your RPMs—Win more trophies with a genuine Vibra-Tak!

At your Hobby Dealer or direct from:



ONLY **500** with leather carrying case

VERDELL
Instrument Sales Co. - P.O. Box 212, El Cajon, Cal.

