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R/C MODELER

This Month's Cover
In the beautiful Valley Forge National Park in Pennsylvania, Heidi Semisch displays the patriotic colored Buzzard Bombshell, which is covered with new Micafilm by Coverite. Site is one of the cannons of Redoubt; four of which guarded the northern approaches to George Washington's HQ and winter encampment of 1776-1778. Model and Ektachrome transparency by Henry Haffke.

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FROM THE SHOP

Don Dewey

Aron Means with his dad's fierce looking Eagle.

Glen Means' gorgeous sailplane is displayed by his lovely daughter Kathleen.

Occasionally the mail delivers an exciting example of ingenuity and craftsmanship that recharges our enthusiasm and keeps us inspired. Recently we received the following letter and photos from Glenn Means, Livermore, California:

Dear Don:

I think you'll find the enclosed pictures to be of interest. The "Eagle" pictured is a sailplane of my own design (with just a little help from Mother Nature). And yes, it does fly — and quite well. With a flying weight of four pounds it does take a fairly good wind. The project started quite a few months ago with trips to the library looking at pictures of eagles, in particular, to determine what proportions to use. Also where and in what direction to put the different angles and bends of the wing. For the proper dihedral to use, in the wind conditions I usually fly in, I spent considerable time watching hawks in my area. As flat as the total wing is, some washout was needed to avoid wing tip stalling. For size, my "Eagle" has a wingspan of 84" with a maximum depth of 11½". The wing and tail area are built-up balsa, covered with Coverite. The body is fiberglass with some plywood and balsa. Styrofoam was carved and sanded to shape then fiberglassed over. The styrofoam was then removed leaving a very strong but flexible body. The "Eagle" was painted with R/S Perfect Paint. The colors I had to mix myself. The Eagle's eyes are plastic eyes which can be found in most ceramic shops. Holding the glider in the photos are my son, Aron, and my daughter Kathleen.

Glenn Means
Livermore, California

Thanks Glenn for brightening up our day, your Eagle is a beautiful piece of work.

★

Our friend Mike Minty, who resides in Singapore, sent us a note describing a situation that a lot of us can relate to. We hope our readers will enjoy it as much as we have.

Dear Don:

Having recently acquired a kitten I am at a loss to know how I have managed without one all these years of aeromodeling. For those of you without the useful and omnipresent tool I will describe some of its main uses.

One of the first discoveries was its ability to determine the wetness or dryness of a recently applied coat of paint. One small paw judiciously applied can tell you immediately by the trail of footprints across the workbench and the delicate smudge left behind. Alternatively a gentle brush against it by a small cat flank can leave a fine dusting of hair that will tell you forever that it was wet. Another useful feature is bench clearing — you don't have to when there is a kitten around. Pussy (of course, that's only her pet name, her full name is Pussy Cat but Ms Cat sounds pretentious), has the great desire to see a clear table, small tools, screws, plugs, pins are all fodder for her efficient paws. Whack! And a screwdriver is on the floor; shove! push! and the modeling knife buries its blade in the floor next to my foot; push! push! push! and the electric drill approaches the edge! The fact that you may never see some of these again is a small price to pay for such efficient bench clearing.

I was covering a wing of my PT19 just now and couldn't understand why it became so tip heavy as I tried to finish the center section — answer — one clinging kitten on the tip. Now I need some help. Do any of you top scale buffs know of an incident around 1945 when a PT19 was attacked by a lion, tiger, cougar, leopard, anything? I need something to put in my scale documentation to explain the teeth marks in the port wingtip!

Finally, there is the acid test for the condition of your heart. I was quietly working on the repairs to my Sig Citabria which rolled on final approach and "modified" the

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How many of our readers can relate to Ed Slobod's helper?

SUNDAY FLIER

Ken Willard

Do you ever get the feeling that this R/C hobby/sport of ours is getting so technically sophisticated that you really should go back to school so you can understand it? I refer, of course, to the electronic phase of the sport; the aerodynamics are a combination of science and art, and the theory and practice of thermodynamics combined with mechanical design in the production of our model engines is pretty well-established. Structures are undergoing more critical analysis as the larger models become more and more popular and the need to correctly determine the stresses imposed on wings, fuselages, landing gears, and control surfaces is becoming more important. But the electronic advances --- at least to us old timers --- are nothing short of miraculous.

Some fifteen years ago I published a graph which showed the rate of reduction in airborne receiving units, including batteries and servos, which had prevailed up until that time. Then, extrapolating the curve, and assuming development programs would continue, the prediction was made that four control function airborne units would be made that weighed less than four ounces; the time frame indicted that this would occur in about fifteen years. The prediction came true. Cannon Electronics' Super Micro unit provides four channels of control, and the receiver, servos (four) and battery pack all together weigh in under four ounces. True, the battery pack is only 100 ma, but that is ample for small models. So miniaturization has made great strides.

Similarly, nearly all other phases of the electronic systems have made tremendous strides. Dual rate, exponential rate, reverse circuits --- you name it, somebody has done it.

Well, almost. There still is one area where the improvements have been slow in coming. Batteries. True, nickel cadmium cells have been improved a bit --- the ability to fast charge being the most immediately apparent advance. But batteries still present problems to R/C modelers. Look at all the discussions there are relating to them --- memory, reverse charging, unequal shelf life, unbalanced packs, etc. However, all these problems can be minimized through the use of the electronic measuring devices available. Except that those devices usually don't give you a reading when your airplane is flying.

Recently I saw a big Quarter Scale job go in for a bad crash.

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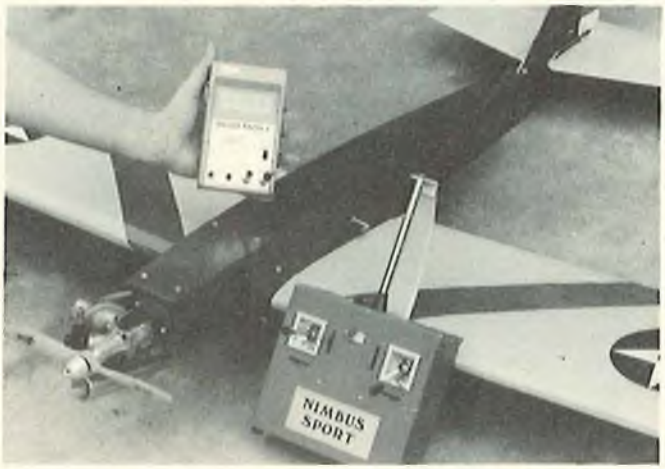


Accu-Tach reads airborne battery pack voltage at 4.97 volts, under load. Go ahead and fly.

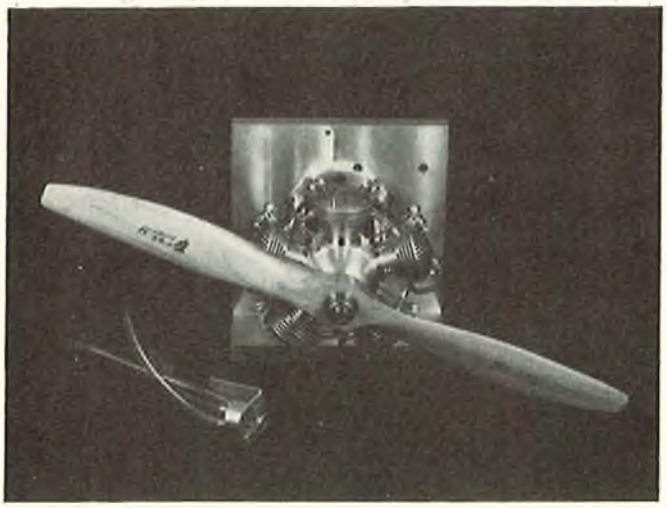
Accu-Tach shows X-mitter voltage at 9.77 under load. Safe to fly.

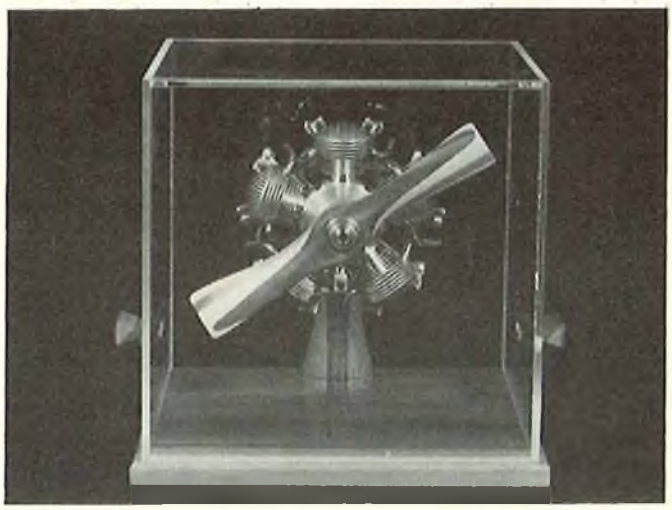
Accu-Tach reads 18,200 rpm on Quickie 500 racer's K & B .40. Go get 'em!

Dr. Walter A. Good holds a replica of his original design, "Guff." It was one of the earliest R/C designs. Gordon Pearson, President of the League of Silent Flight provided this photo. Gordon is at left.

ENGINE CLINIC

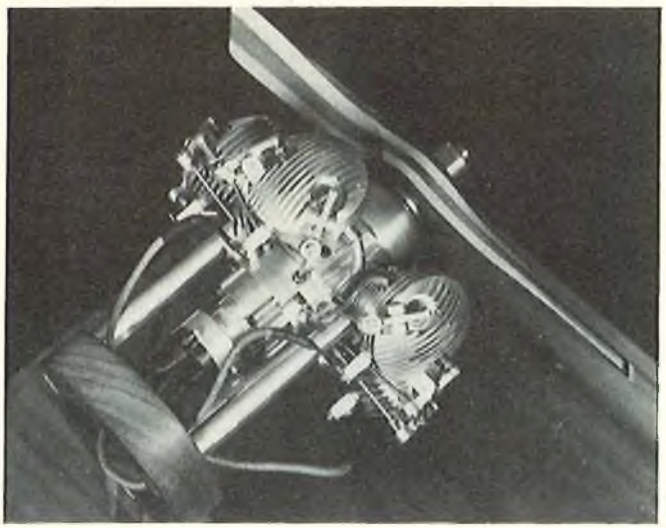
Clarence Lee

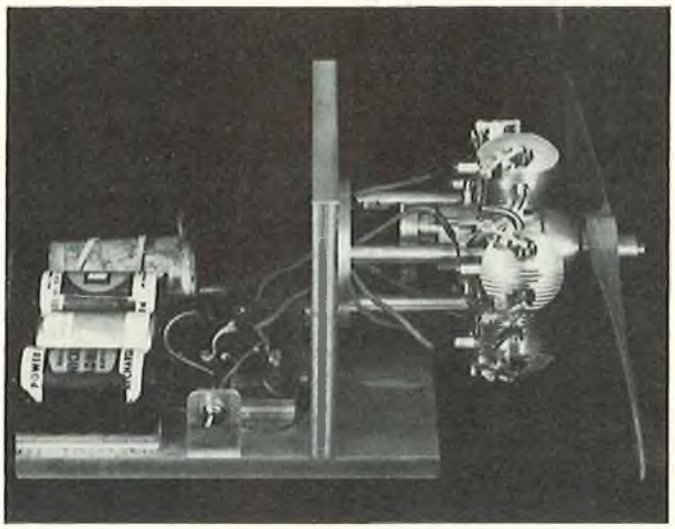


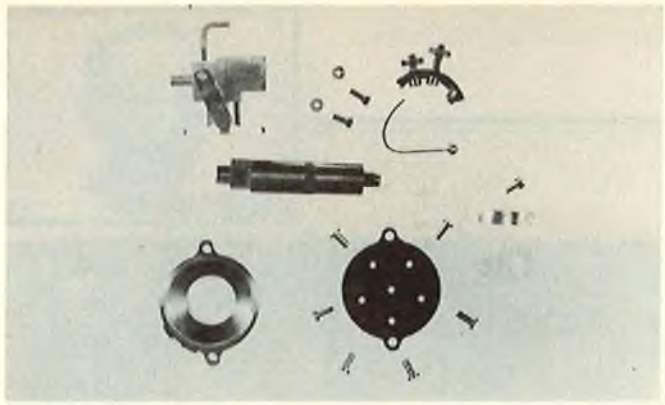


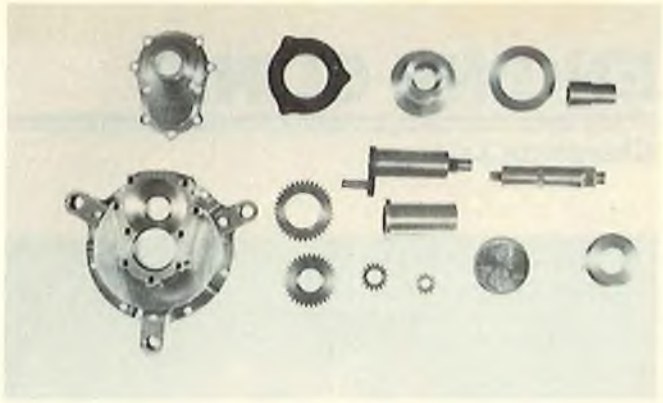
Over the years I have built many prototypes and one of a kind bar stock engines. If more than one or two engines are intended to be built you usually go the sand cast route which means making wooden patterns of the aluminum parts which are pressed into sand making an impression from which the final aluminum castings are formed. Then the machining operations proceed from there. If only one or two engines are intended to be built, it is usually easier to machine the aluminum parts from a bar of aluminum — hence the name "bar stock" engine. In years past I have made many bar stock racing engines, several twins and my largest undertaking was an inline four. At present, in my spare time, I am working on a replica of a 1936 Fergusson Falcon twin. The Fergusson Falcon was available both in casting kit form and assembled in 1936. This is an engine I had always wanted for my engine collection but after many years of collecting engines I was never able to obtain one. Karl Carlsen and Dick Dwyer who head an operation called Replica Engines obtained the original patterns for the Fergusson Falcon and a four cylinder version called the Condor and offer the aluminum castings for those who want to undertake the project of building their own engine. This is quite a project in itself due to the many parts involved and the fact that the aluminum castings are not "cored." This means the castings are solid aluminum, having only the exterior shape. No internal shaping has been done as is normally done. This has to be done by machine work. Ironically, after starting the project, I was able to obtain a regular production Fergusson Falcon so the home built replica project has been set aside. However, the engine I obtained is a marine version with water cooled cylinders so I am in the process of making air cooled cylinders from the original prints supplied by Replica Engines.

Knowing well the amount of time, effort, sweat and cussing that is required to build an engine from scratch, I was really overwhelmed when I received ten pictures of a bar stock project Rudy Glick of Berthoud, Colorado, had undertaken. Rudy had built his own Morton M-5 strictly from bar stock. Now the Morton M-5 was available in 1945/46 in kit form but the ready cast cylinders and other aluminum parts required only finish machining. To build a Morton M-5 entirely from bar stock was in my opinion the epitome of bar stock









engines. Things of this nature really turn me on and I'm sure others of you who read the Engine Clinic column would appreciate seeing Rudy's magnificent effort. Rudy's attention to minor detail is certainly outstanding with all parts duplicated almost exactly. It is pretty obvious that Rudy is a first class machinist. I know of many people earning their living as machinists who could not even come close to duplicating what Rudy has done. Unfortunately, there was one disappointing part to the whole project — the engine did not run on spark ignition as had been intended. However, a lot of the original Morton M-5 engines did not run without considerable rework either and, in a personal letter to Rudy I passed along some ideas that I thought might help him to get the engine running on spark ignition as intended.

Incidentally, if there are any other "engine nuts" out there who have the equipment and think they would like to undertake building their own engine, Replica Engines address is 14600 Ramstad Drive, San Jose, California 95127. Besides the Fergusson Falcon twin and Condor four, Replica Engines also has a casting kit for the 1946 Talisman .60. This was a racing .60 similar to the Hornet .60 and makes a dandy starting project before tackling a more complex project such as the Fergusson. However, even the Talisman requires previous machining experience and is not for a beginner. Replica Engines also is setting up to produce replica parts for some of the old time engines such as Baby Cyclone, Super Cyclone, and Anderson Spitfire. If you're interested in this sort of thing I recommend that you write for their list of available items.

Rudy's letter follows:

Dear Mr. Lee:

I read your column on the Morton M-5 back in October 1978, and in later articles that the drawings could be obtained from Tim Dannels. This looked like an interesting project, so I ordered the drawing from Tim. After looking over the drawing, an attempt was made to purchase three ball bearings used; was surprised to find that they are still available. With ball bearings ordered, work was started on the engine.

A few modifications were made since it is made out of bar stock instead of castings, mainly on cylinders. The rocker arm pivot supports were fabricated and keyed to the cylinders.

Operation of the engine has been a little disappointing. The only way it has run was by making a manifold with carb attached and running it as a glow plug engine.

It was built as a mantle piece and not intended to be put in the air. Everything I fly sooner or later gets smashed and there are too many hours of work to smash --- 500 hours estimated construction time.

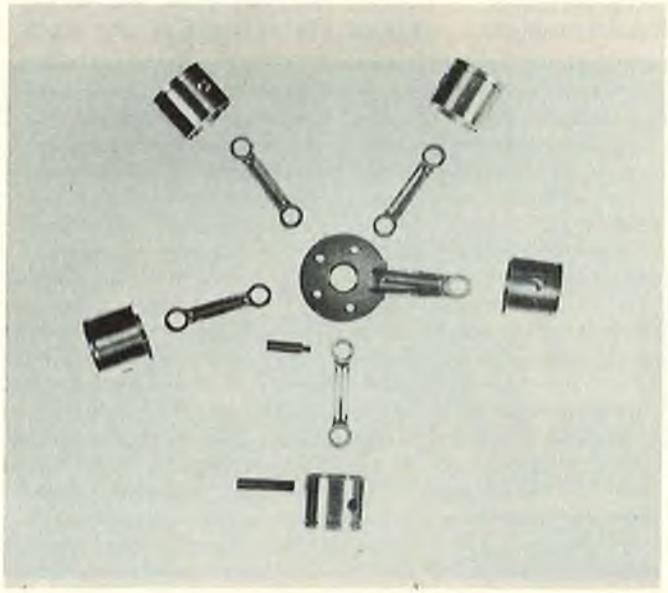
I used to do machining for a living for some 20 years or so, but I have been out of the shop for seven years in an office job. I enjoy shop work so I purchased a small lathe and mill for the basement.

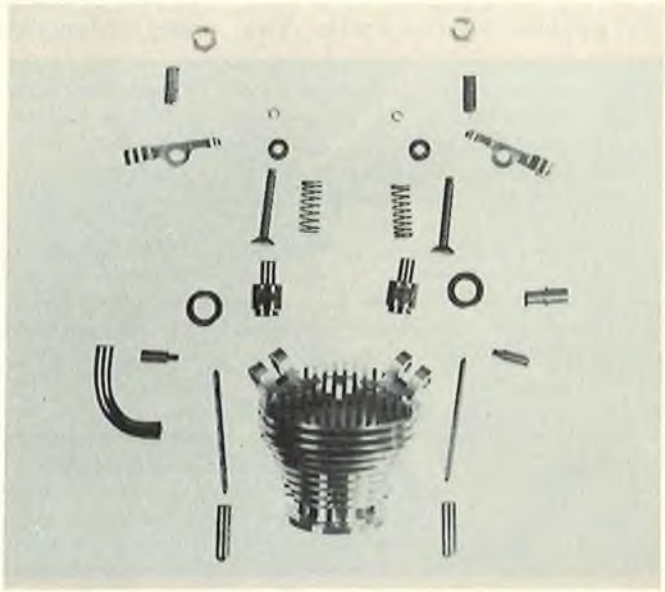
Enclosed are some pictures you may use if you wish. These pictures were done by Gary Patterson, a fellow model club member in Boulder, Colorado.

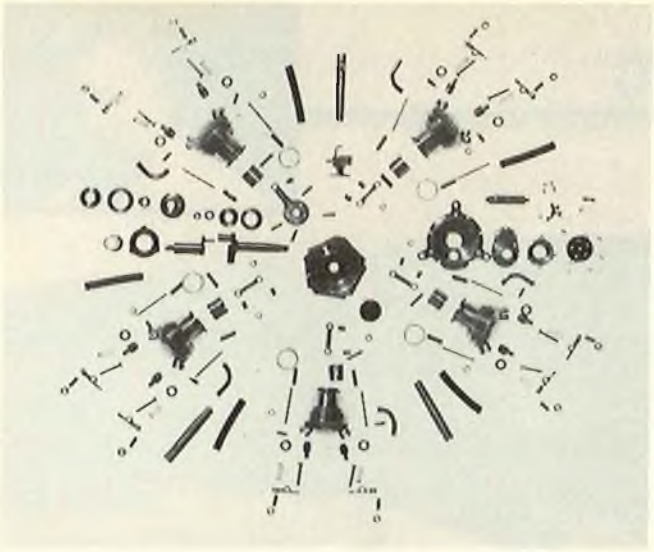
This was a fun project. Thank you for the information which motivated me to get started.

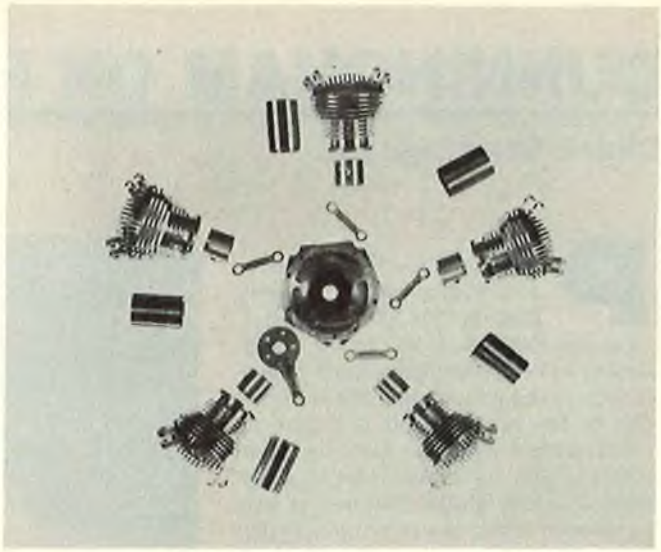
Truly yours,
Rudy Glick
Berthoud, Colorado

Readers who have been following Engine Clinic this past year will know that we have had several letters from fellows looking for parts for their Testor/McCoy engines. Testors having gone out of the engine business. I received a note from Walter Conrad of









Pittsburgh, Pennsylvania this past month informing me that RJL Industries (who now manufacture the Kraft .61 engine) had purchased all of the remaining parts, tooling, and dies for the McCoy engines. A follow up letter to RJL Industries resulted in a phone call from Randy Lansalato confirming that they had purchased the remaining parts and tooling. Incidentally, the RJL comes from Randy's initials. There had been some speculation that the "R" was Roger Theobald who was co-designer with Carl Hammons on the Kraft engine. This is not so. So if any of you with Testor/McCoy engines are in need of parts, write to RJL Industries for a list of the parts they have available. Unfortunately, not all parts are available but many internal parts are, such as rings and pistons. See RJL's ad in the magazine for the address. I should also mention that these parts are for the series 21 engines. Do not write for old time ignition, McCoy .60, etc., parts. The tooling, patterns, etc., for the older engines are in the hands of Dick McCoy. Dick McCoy, incidentally, has some parts for the old McCoy .60 available — piston, rings, rods, sleeves, etc. Dick's address is 5674 San Bernardino St., Montclair, California 91763. Write for his listing and be sure to enclose a self-addressed stamped envelope.

★

Judging by the number of Custom K & B 7.5 ducted fan engines I sell and the number of ducted fan kits on the market there is considerable interest in this phase of the hobby. Art Arro, a well-known east coast Formula I flier and former editor of the N.M.P.R.A. Newsletter sent in the following observations he had made that I am sure many just starting their first ducted fan aircraft will find useful.

Dear Clarence,

Here are a few tips for operating K & B 9100 ducted fan engine.

(1) Best plug is the OPS RC 300 which has a heavy wire filament to stand up to sustained 22,000 rpm operation. I get about six flights per plug using about 14 oz. of 25% per flight.

(2) Best pipe is the MAC's 8.5cc tuned pipe ***without*** *muffler. The K & B #5156 is a close second and provides easy mounting via a 6 x 32 bolt used as a stud in the center of the rear end.*

(3) Provision must be made for adjusting pump pressure for varying weather conditions. I cut a slot in the tail cone and bend the Perry wrench while heating it to a cherry red color.

(4) Many top fliers (Tom Cook, Larry Wolfe) have switched to the O.S. 7D carb from the O.S. 90FSR with all choke inserts removed. I turn down the carb body neck to fit the carb adapter and cut the adapter below the shoulder. The carb should fit flush to the case in order to clear the stator vanes of the Scozzi fan unit. Also the engine must be positioned to the extreme rear of the pan to clear the stators. The carb, sleeve assembly should be RTV'd in place and all screws treated with Locktite®. Bob Violett uses Devcon Plastic Steel® to secure the carb to the case and seal all joints.

(5) The engine may have to be shimmed to the pan to center the fan rotor in the shroud. Or, the engine mounting surface may be milled to provide centering.

(6) The entire rotor, spinner cone assembly ***must*** *be balanced on a High Point or equivalent balancer. Also everything should be epoxied or Loctited in place.*

(7) Larry Wolf supplies a machined stud to connect the fan rotor to the engine. You may be making this stud for Larry. (No, C.L.)

(8) The tank clunk must be weighted with additional brass and solder to insure proper fuel feed in all flight positions.

(9) Filtered fuel is a must, especially with the Perry carburetor. K & B 1000 or Cool Power 25% are good.

(10) I usually fly at 21,800 which is 500 to 700 rpm down from peak. If I don't achieve these figures I find out why or do not fly.

These ten steps have evolved through three years of ducted fan flying experience along with numerous discussions with Bob Violett, Tom Cook, Larry Wolfe and Charlie Chambers. We all learned this in the "school of hard knocks" or flameouts and are eager to pass the information on to all ducted fan enthusiasts.

That's all for now.

Best regards,
Art Arro
Ann Arbor, Michigan

The following letter is typical of many we have answered on this subject over the years and still keeps popping up. Because of the number of letters that keep coming in regarding fuel leakage out the front bearing we will give it another go.

Dear Sir:

I am having quite a problem with a K & B 40 #8011. It runs great and I had many flights with it before it started to leak fuel out of the front bearing. I sent it back to K & B and they replaced the entire front section. The problem is, it leaked worse than the original one. I purchased a new bearing that had a closed face (K & B Part #6996) and installed it in place of the new bearing which was open faced.

It still leaks, not really bad, but nevertheless leaks, wasting fuel. I use Red Max 10% with 4 ounces of castor oil added per gallon.

I would appreciate anything you might suggest as to a cure. Thank you.

James E. Losie
Apollo Beach, Florida

A little leakage out the front bearing is perfectly normal and

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CUNNINGHAM ON R/C

Chuck Cunningham

Pretty soon the flying season will begin again in most parts of the U.S. For those of us in the Sunbelt, it has never really ended; in fact, oftentimes more flying is done in the winter than the summer due to the hot weather and lure of other outdoor activities. But no matter whether you have been locked away from flying by Mother Nature, or you have been doing some flying all year long, it's a good idea to take a look at your radio equipment every now and then to see if everything is working okay.

Yesterday, on a cold, blustery December day, I was flying my .61 Turbulent when suddenly I got a bump of down elevator. Not enough to crash, but enough to make me chop throttle and head for the runway. While on the landing approach, a couple of more sharp blips of down kept me on my toes, and made me very happy when the wheels touched the runway. I was flying at a field that I had never flown from before, and it might have been a skip radio wave, or a bit of bounce from the low cloud cover, or something from the radar set-up at DFW airport, which isn't too far from this field. Or, perhaps, it could be a bit of radio problem, a servo with "glitchitus," or a loose battery connection, or . . ., or . . ., or. But, before I fly with that radio again, I'm going to check it out just to see what I can find.

My old friend, Rex Johnson (that's Helmer's number one son), is putting out an electronic marvel that will make checking things out just a bit easier. Rex, under the name of Norcal Avionics, is marketing the Accu-Tach I. This small electronic box has a three-fold use. It is primarily an electronic tachometer, much in demand for both Formula I and Quickie race fliers, and for biggie model builders to help in the proper prop selection for the large gas engines. It has the added features of serving as a voltmeter up to 19.99 volts DC, and as an ESV (Expanded Scale Voltmeter) which can monitor your batteries, both receiver and transmitter, under load. It can even be wired so as to allow you to monitor a servo to see just how much current that servo is drawing when working. All of this can be accomplished by a combination of extra plugs from Radio Shack, and plugs for your radio equipment. It is a well-constructed and thought out device. It is available from Norcal Avionics, P.O. Box 70956, Sunnyvale, California 94086, or from Sheldon's Hobby Shop, 3157 Alum Rock Ave., San Jose, California 95127. The list price is $79.95. After completing this column, I'm going to do a bit of checking on my radio.

Marv Reese's cardboard and foam Jumbo Mooney Mite. Gemini Twin for power, 19 lbs.

The reason that I was flying at a strange field is that yesterday was a meeting of the North Texas Miniature Aircraft Association. This group is IMAA Chapter 21, and dedicated to the enjoyment of the big birds, quarter size and up. (Okay, so my Turbulent isn't exactly a Big Bird, but at 6' span, it's 28% of the full size.) This club is made up of RC'ers who generally belong to other clubs, but have founded this club to bring together fliers from all over the vast Dallas-Fort Worth area who like jumbo airplanes. We have developed a good format, and one that will get even better with good weather. Our club meetings are held every two months, and each meeting is at a different area flying field. We meet on Saturday mornings, transact a small bit of business, then unload the station wagons, vans, trailers, or what have you, and fly until the last guy gets tired of flying. Yesterday's get-together was made even better because one of our members, Bill Miller, owns a restaurant in Irving, Texas (Capt. Nemos), and he treated us all to a great breakfast spread, and then we braved the cold day to fly. Sure does beat sleeping in on a Saturday morning. By the way, this club is open to anyone from the North Texas area; so if you are interested, contact Al Alman at 2609 Burningtree Ct., Arlington, Texas 76014, (817) 277-2322.

While on the subject of the jumbo models, I received a letter from Marvin Reese, 9050 Harvest Ct., Wichita, Kansas 67212, announcing a Jumbo R/C Fly-In to be held in Wichita, Kansas, May 1 and 2, 1982. If you want further info, write to Marv. This Fly-In is to be patterned after the Southwest Jumbo Fly-In format. Marv also sent a picture of his newest big bird, a Mooney Mite completely built of cardboard and foamboard. Power is a Gemini Twin, and weight is 19 lbs. Marv says that is a bit marginal at this weight for the Gemini at take-off but, once in the air, does great. He is now building one a bit smaller, and should tip the scale at 14 lbs. If Marvin gets the time he will give a bit more information in the future on this type of construction.

You know, it would really be nice to have a neat workshop. How many of you do have one? Come on, hold up your hands. Ha, not many hands sticking up in the air, are there? I'm really not sure just what it does take to have a neat workshop, but there is a pretty darn good chance that I will never know what it's like to have one. Sure, every now and then, mostly then, I get the urge to clean up. So, I

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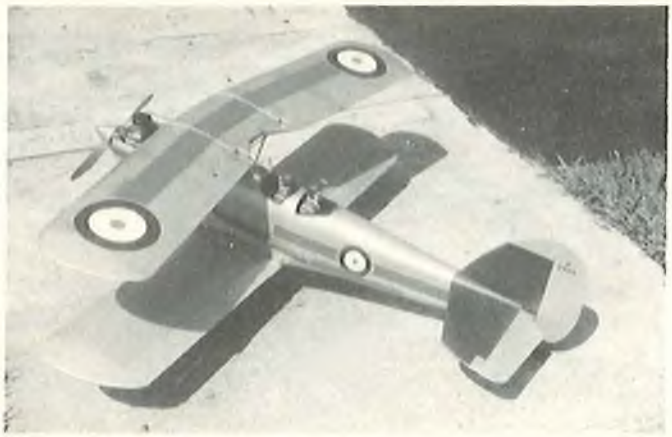
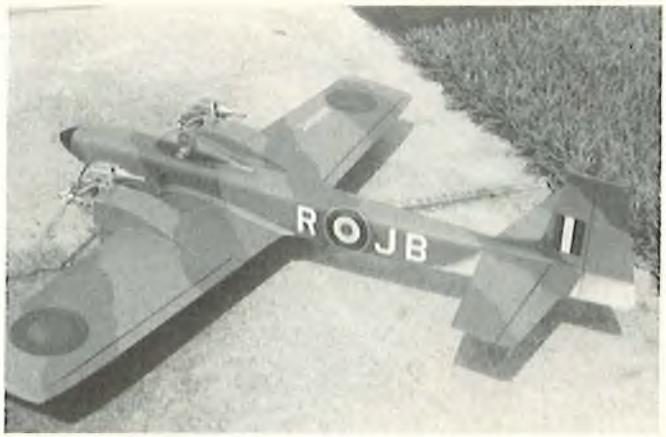


Hawker Deamon from Aeromaster kit. By R.J. Barbosa.



Twin engine Kaos. ST .35 engines. By R.J. Barbosa.

sweep the floor, clear off my big table, shuffle some things from this place to that, and create a little working room. But, pretty soon, I'm back to working on about ten percent of the area, while the other 90 percent is taken up with clutter. Seems like there ought to be a better way, and I know that there is, but I just can't seem to get my act together. What goes into making a really good workshop is another matter though. The tools that you need (or those that you don't need, too), are really not too many, and it doesn't really take a fortune to equip a good shop. The best way is to start off with a small amount of inexpensive tools, then as the time goes by, gradually add a couple of tools a year. Basic modeling can really be done on a limited tool scale. Let's take a look.

If you build only kits, your tool use is much less. If you build from magazine plans or scratch, then you need more tools to help. But, perhaps the first tool that you should acquire is a 1/4" variable speed drill, and a set of bits. How are you ever going to mount an engine or a control horn if you can't make a hole of the proper size? You can use single edge razor blades for cutting balsa and covering material, but as soon as you can, invest in an X-Acto knife set that has three handles and several blades. You can add specialty blades as you go along. Get a stiff back saw blade for the X-Acto set, and a package of regular saw blades. Just these two items — the drill and the knife set — will allow you to construct many aircraft. Perhaps the next tool that you need to acquire is a soldering gun. It seems that there is always something to solder on each aircraft. Again, this depends upon the type of aircraft that you're building and the type of control hook-up that you use. Some hook-up systems need no soldering.

If you progress in your modeling, then you will need some more power tools. You can cut out lots of plywood parts with a simple hand-held coping saw, but if you want a bit more muscle, then purchase a jig saw. The Dremel jig saw with the long arm is very good. Next, you may want to add a drill press stand to your hand-held electric drill. Another useful item to acquire is a bench mounted vise (I'm still using the one I bought when I was twelve years old).

Okay, that's the basics of a workshop. But, what if you really are serious, and want more power tools? Well, as I have said before, the crown jewel of my workshop is a Sears 12" band saw. I use it constantly while I'm scratch building. I use it to cut out wing rib stacks, rip up balsa logs to get sheets just the right thickness, and rip up pine boards to get longerons and wing spars for my big airplanes. I have a table saw that is about twelve or thirteen years old, but since acquiring the band saw, I never move the table saw out of the corner. Another tool (or convenience) that you need is good lighting. Frequently, you will see ads on sale prices for two bulb fluorescent fixtures. These are pretty cheap. You can hang them from the ceiling, and plug into a wall socket for power. You can purchase a pull chain switch at the local hardware store and add this to the light fixture, or simply remove the plug from the wall socket when you want to turn off the lights. Several of these light fixtures will really help in your workshop.

Another tool to add as you go along is a bench mounted larger drill press. There are often advertisements by tool shops for a drill press with a 1/3 to 1/2 hp motor and three to five speeds, all cast construction with a chuck size up to 1/2". I bought one like this some time ago for only $99.50 and it really has been great. I ran out of space on my bench (the darn thing weighs about sixty pounds) so I built a wooden stand out of scrap lumber and moved it into its own corner of the garage. Of course, if you are really into tools, you will want a power sander, and a power belt sander, a shop vacuum cleaner, a Dremel Moto-Tool, an exhaust fan to remove all the funny fumes that the stuff we use puts out, storage boxes with multiple drawers to store all of the small items that you accumulate, an air compressor and paint spray rig if you want to paint your models, and

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Twin Stick prototype for new Midwest kit. By R.J. Barbosa.

Hammer Head Shark twin. K & B .35 engines. By R.J. Barbosa.

FLYING LOWE

Don Lowe

Here we go again --- and, as usual, I'm scrambling at the last minute to get this out. I thought that I would have plenty of time to write this column after retiring but I seem to be busier than ever. Of course, the holiday season is just behind us and with it came the Tangerine Internats held here in Orlando. Besides the excitement of this multi-event contest, it brought reunion with many old friends from far and wide.

This competition which has been held for 14 years always attracts outstanding competition. I'm sure there is a combination reason for many to come, especially the snow-belters: to vacation in the warm climes, to visit Disneyworld and the many other attractions here.

This year the events included, over a seven day span, Quarter Midget pylon, Formula I pylon, several classes of helicopter, all classes of pattern and all classes of scale. It even had a special $500 award for the best jet aircraft, which will be repeated next year. This year it was won by Bill Williamson. The weather was beautiful most of the time, ranging into the high 70's several days. So, if you've never been here, you should certainly plan to do it next year. I've attended every Tangerine contest and I plan to keep doing it now that I live here.

Instead of giving you the usual long list of winners, I thought I'd turn it around a bit and give credit to those who did the work. I'm sure I couldn't name all of the helpers, but believe me there were many. The RCACF (Radio Control Association of Central Florida) Club really turned out and did a tremendous job of organizing and putting on a top quality extravaganza. Special credit must go to the event directors who were: Terry Ferentinos, scale; Mal Sheperd, pattern; Dick Antoszowski, racing; and Walt Schoonard, helicopter. Pattern and scale flight judging was handled by a combination of USPJA judges, plus locals, including your's truly.

I didn't hear a single complaint about pattern judging and, from my observation of score sheets, it was pretty uniform and fair. The scale flying was highlighted by flight demonstrations by the Kissimmee Demonstration Team with their astounding free-fall parachuters, equipped with parafoil chutes. We also had a chance to demonstrate the new "turnaround" pattern, but that's a story in itself.

Terry Ferentinos of Orlando, Florida, and his Mallory Laser 200. 12½ pounds with Master Climb/O.S. .90 power. A possible contender in new "turnaround" pattern.

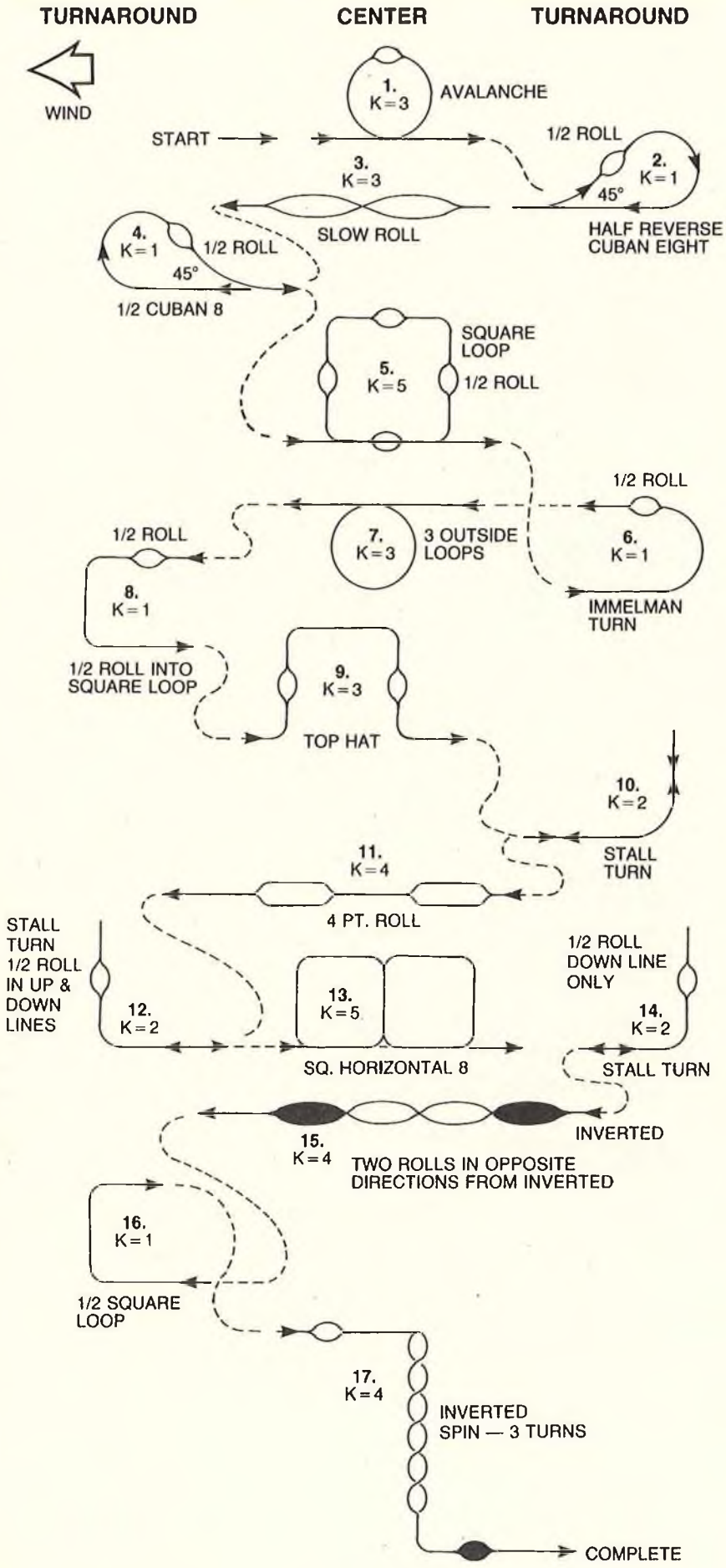
Pattern Observations:

Instead of competing this year, I chose to be a pattern judge. After three days of judging over 300 flights I thought I would pass on some observations that may be helpful. Almost every available pattern ship design was flown in the competition. I might add that a number of them were built by Sam Leonard of Orlando. He does a beautiful job of custom fabrication. Every conceivable combination of airplane, engine, pipe, retracts, etc., was evident. There were many ships with buried pipes, such as Magics, Arrows, Compensators; however, every class was won with a ship having an external pipe. What does that prove? Well, it suggests that a buried pipe isn't necessary to win. What counts most is a good ship, properly set up, and flown by a very skillful pilot --- the most important ingredient. The buried pipe is primarily cosmetic, and it also reduces the drag of the ship. It does create some problems in cooling and, in severe cases, can create trim changes

TABLE 1

	K Factor
1. Avalanche (loop w/snap on top)	3
2. Half reverse Cuban eight (TAR)	1
3. Slow roll	3
4. Half Cuban eight (TAR)	1
5. Square loop with four 1/2 rolls	5
6. Immelman (TAR)	1
7. Three outside loops	3
8. Half roll into half square loop (from the top) (TAR)	1
9. Top hat	3
10. Stall turn (right or left for wind correction) (TAR)	2
11. Four point roll	4
12. Stall turn with half roll in upline and downline (TAR)	2
13. Square horizontal eight	5
14. Stall turn with half roll on down line (TAR)	2
15. Two rolls in opposite direction (from inverted)	4
16. Half square outside loop (from bottom) (TAR)	1
17. Inverted three turn spin	4
	Total K = 45

1984 FAI "TURNAROUND" PATTERN



due to heating of the fuselage. So, if you are contemplating a buried pipe, make sure that you know what you are doing in setting it up.

Many ships showed evidence of improper aileron set-up for rolls (non-axial rolling). This you must play with by adjusting C.G. and aileron differential, plus wing, tail, thrust alignment to get it right. But, when it is right, your ship will be a joy to fly. A number of competitors were flying the Australian "Magic Muffler." This tuned device seems to do a good job but is noisier than its tuned pipe cousin. Some of the fliers used non-muffled tuned pipes. These are **very noisy.** I might add here that the buried pipe installation does tend to reduce the radiated noise from the pipe. Also, a wood ship is less noisy. There was evidence of three-bladed props in practice but none were flown in competition. So, if you are going for a quiet set-up, a wood ship with a buried muffled pipe and a three-bladed prop is a good choice.

Now for some observations on common mistakes made by fliers in their flight performance. First of all, the most common mistake is entering the maneuver with the wings not level and without a definitive entry. For example, many would enter loops by allowing the ship to slowly balloon into a pitch up. The loop is properly entered by being absolutely straight and level until a definitive pitch up right **in front of the judges.** Many make the mistake on the inverted outside loops of rolling right in front and pitching up immediately after the ship is past the judges. Properly entered you must roll inverted, pause, and pitch up **right in front.** It is completed by stopping the loop(s) right in front, pause and roll out just like the entry. Of course there are many other mistakes made in the loops, such as not being round, wings not level, loops not concentric, etc. Probably the most abused maneuver is the Cuban 8. It is very pretty when properly done but is difficult. Most fliers wait too long to pitch up into the maneuver, cut it off on the top into a kind of off axis oval, make a very long down line into the half roll, make the second half non-symmetrical with the first half and miss the crossover. You must remember that the Cuban is two round **loops** with a 45° downline into a crossover right in front. When you do it, think **round!**

Well, I could go on and on with this for several columns, but I want to break it off for now to discuss a subject of great importance to the pattern flier.

Turnaround:

While at the Tangerine, Ron

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HERE'S HOW

By Jerry Smith

Retractable landing gears have been with us for some time now. When it comes time to hang a landing gear well cover on the strut, some of us run into the sticky problem of how to fasten it securely. There are many ways of doing this, however, it is essential that the chosen method be reliable and simple. My good friend Col. John DeVries came to our rescue with a tried and proven method that he has used a time or two.

John's suggestion involves the use of Goldberg-type adjustable axles. Seems like he can never bend Rom Air landing gear legs at the right length. (I have that trouble also.) A couple of wheel collars and some brass tubing make up the other necessary material requirement.

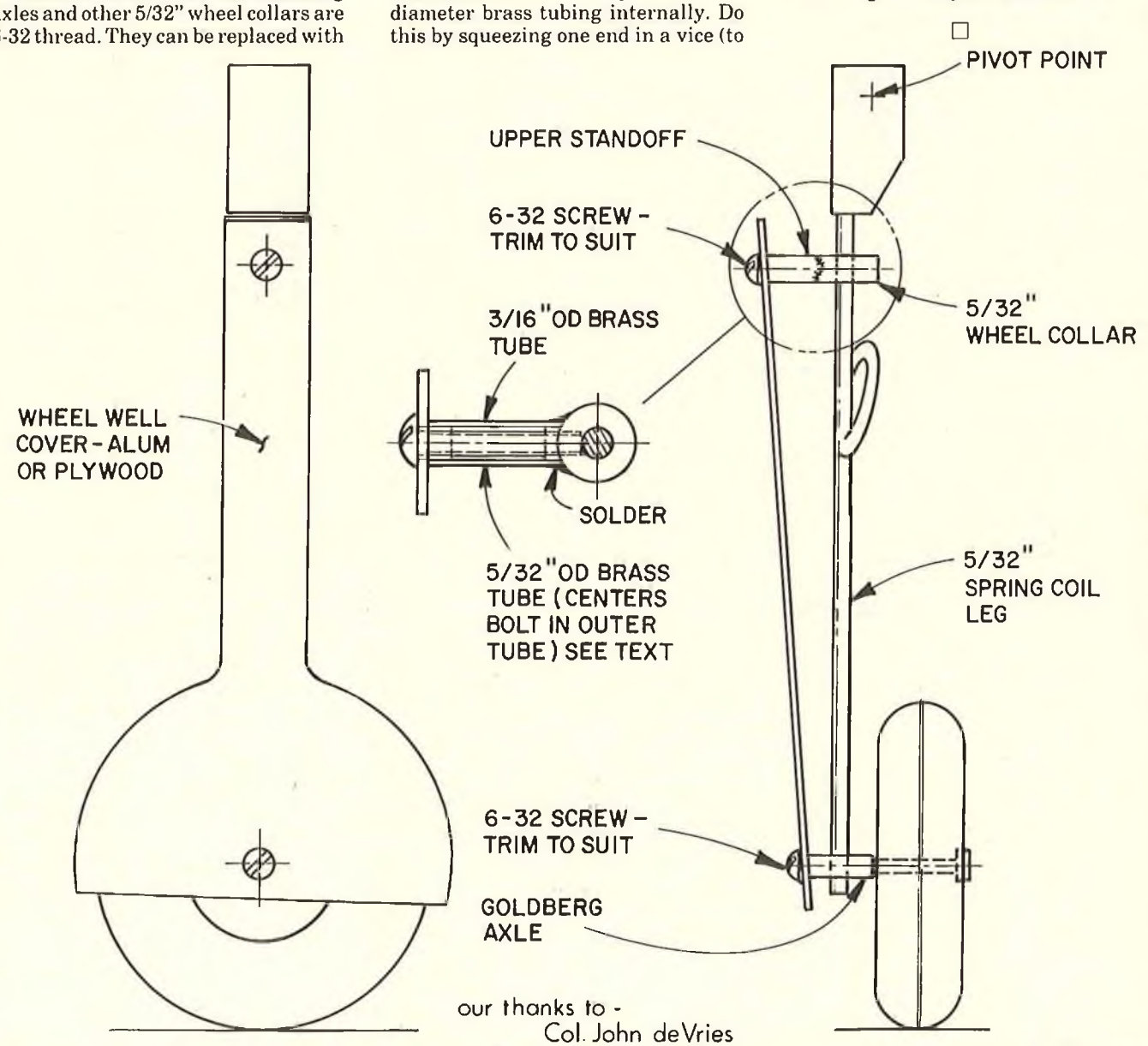
The set-screws used in Goldberg axles and other 5/32" wheel collars are 6-32 thread. They can be replaced with a standard 6-32 bolt. Looking at the sketch we see that the use of a special length 6-32 bolt (trimmed) is used to hold both wheel cover and axle at the lower end of the gear. Shimming may be necessary to accomplish a good tight fit.

The standoff at the upper end is made from a 5/32" wheel collar and a properly sized brass tube soldered together. A 6-32 bolt, trimmed to proper length, retains the cover to the standoff and the standoff to the landing gear leg. Finally, although the use of Goldberg axles allows for setting wheel "tract," adjusting the wheel covers to fit flush with the surface of the wing can be accomplished by "skewing" the cover relative to the landing gear leg.

To make the upper gear cover standoff: thread a short piece of 5/32" diameter brass tubing internally. Do this by squeezing one end in a vice (to hold it) and then run a 6-32 tap in the other end, approximately 3/4". Using a House of Balsa cut-off wheel, cut off a short section. Screw it onto a 6-32 bolt and slip this assembly into an approximately sized piece of 3/16" OD brass tube. Tighten the bolt into the set-screw hole in the wheel collar. This centers the set-screw bolt over the set-screw hole. Next, solder the 3/16" tube to the wheel collar. Soft solder will do the job. Now the 3/16" tube and set-bolt can be trimmed and filed to exact length. The 6-32" threaded brass tubing, used for centering the bolt in the 3/16" OD tube, is only necessary in case the standoff is long and, of course, during fabrication of the part.

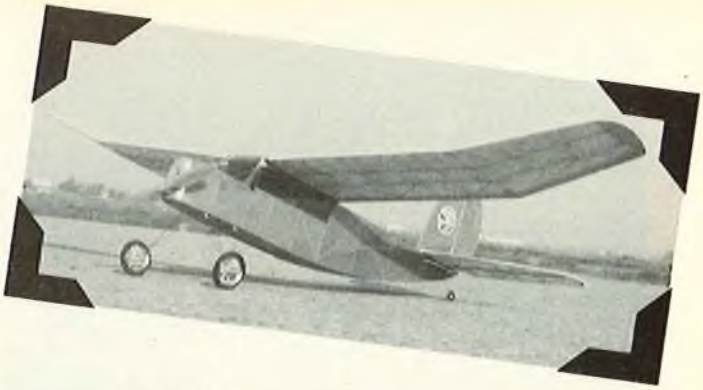
You'll find this a neat way to fix landing gear well covers for R/C models using retracts. Try it next time. A great way to hold 'em!

□



our thanks to -
Col. John deVries

MISS PHILADELPHIA IV



Original free flight Miss Philadelphia designed by Maxwell Basset. R/C conversion was created by Randy Wrisley. Photos by Irene Wrisley.

What do you get when you combine a Curtiss "Robin" fuselage, a DeHavilland rudder, and a Wanderer wing? Why you get Maxwell Bassets' Miss Philadelphia IV! Max's model is generally given credit for being the first gas model to win a major meet. The two hour plus flight consumed 13 ounces of gas, one human timer, and Max's best pair of tennis shoes!

The model presented herein is scaled down to a manageable 6' wingspan. Ours weighs in at 45 ounces and flies up a storm on an Astro 05 gear drive unit. For you "gasolineers" out there, a hot .09 to a mild .19 will do just as well. Like almost all Old Timers, Miss Philly is a stable, forgiving, let your wife fly it type of model. Ours thermals easily, and with all that stab has great stall characteristics. So what are you waiting for . . . get busy and build one!

MISS PHILADELPHIA
Designed By: Maxwell Basset
R/C Conversion: Randy Wrisley
TYPE AIRCRAFT
Old Timer Sport
WINGSPAN
75 Inches
WING CHORD
10" (Avg.)
TOTAL WING AREA
720 Sq. In.
WING LOCATION
High Wing
AIRFOIL
Clark 'Y'
WING PLANFORM
Constant Chord Center
Tapered Tips
DIHEDRAL, EACH TIP
4½ Inches
O.A. FUSELAGE LENGTH
44 Inches
RADIO COMPARTMENT AREA
(L)13" x (W)3½" x (H)3¾"
STABILIZER SPAN
31½ Inches
STABILIZER CHORD (incl. elev.)
7¼" (Avg.)
STABILIZER AREA
220 Sq. In.
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
10¼ Inches
VERTICAL FIN WIDTH (incl. rudder)
8½ Inches
REC. ENGINE SIZE
.09-.19
or 05 Elec. Gear Drive
FUEL TANK SIZE
4-6 Oz.
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
3
CONTROL FUNCTIONS
Rud., Elev.,
Throt./Motor Shut-off
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa, Spruce & Ply
Wing ..... Balsa & Ply
Empennage ..... Balsa
Wt. Ready To Fly ..... 45 Oz.
Wing Loading ..... 9 Oz./Sq. Ft.

Fuselage:

Use 1/4" square lumber and 1/32" ply doublers for gas. 3/16" square and 1/64" ply doublers for electric. Be sure to use spruce at the locations shown. Build one side on top of the other, exclusive of the ply doublers. When the sides are dry, separate them carefully. Cement the doublers in place in the cabin area only. Begin assembly of the fuselage by pinning the sides upside down over the top view. Install the cross braces top and bottom from the front of the cabin to the tail. The diagonals are cemented in too, making sure they run in different directions when viewed from the top.

Pull the fuselage off the top view, and pin it back down again right side up. Carefully flex the nose into shape. Use the cross braces to hold the middle apart. When you get the correct contour, Hot Stuff the doublers to the sides. Epoxy the firewall into place as shown for electric, or move it aft to fit your gas motor. Bend up the landing gear from 3/32" m.w. for electric or 1/8" m.w. for gas. Epoxy the 1/4" plywood landing gear cross pieces into the bottom. Plank where shown with 1/8" lite ply and install the 1/2" triangle stock gear support blocks. Cement former F2 in if you haven't

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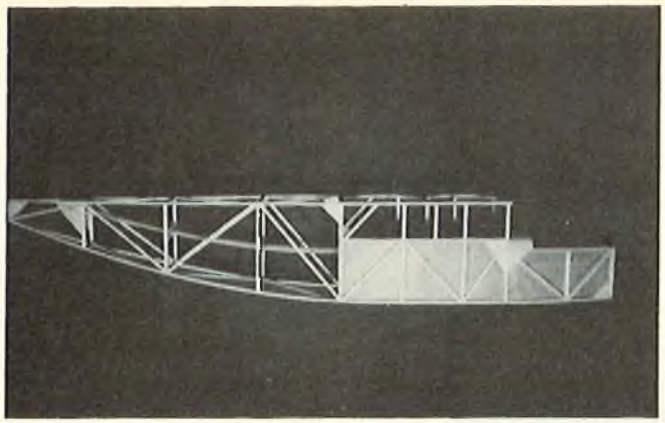
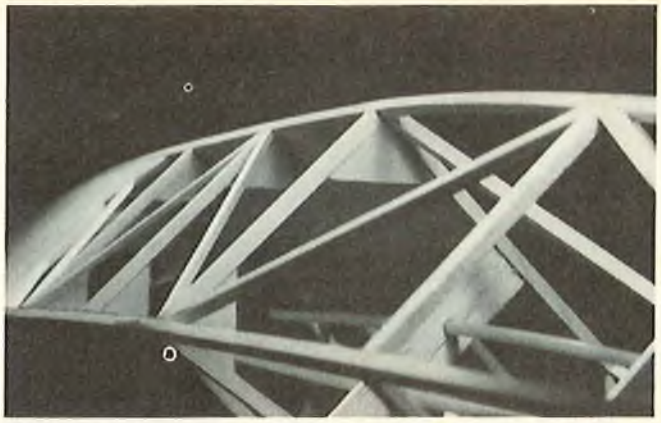
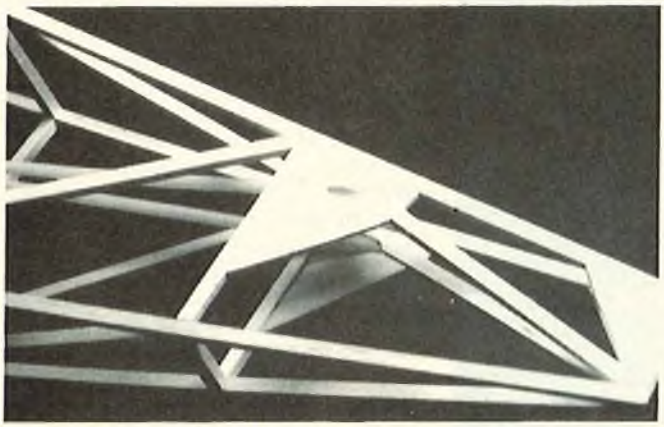


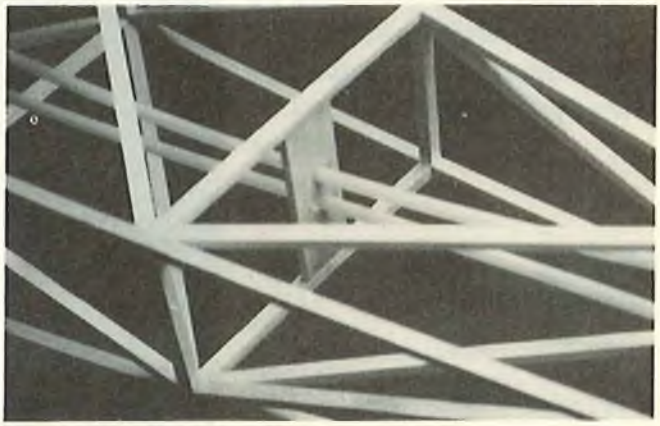
Fuselage structure with pushrods installed.



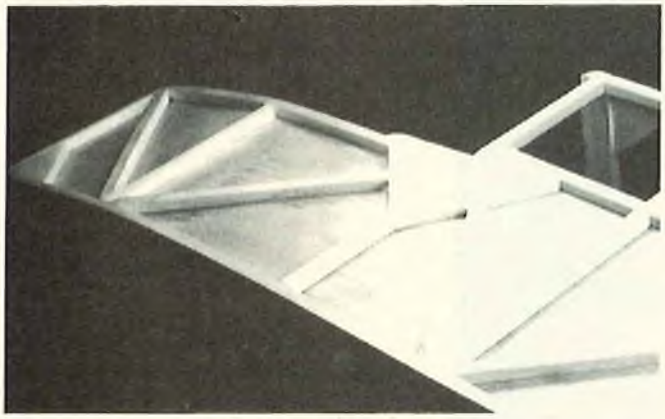
Detail view of gussets in cabin area and pushrod support.



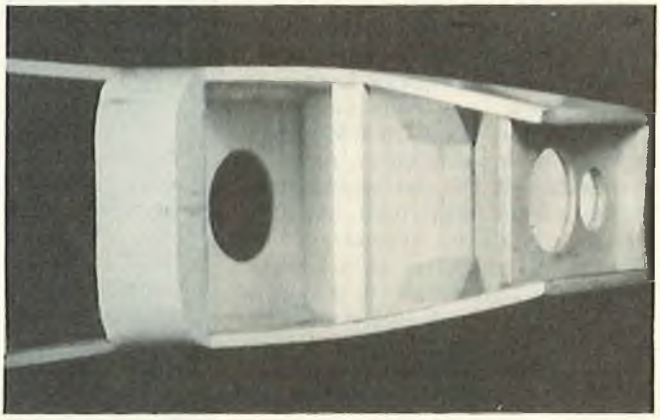
Pushrod exit details and aft gusset.



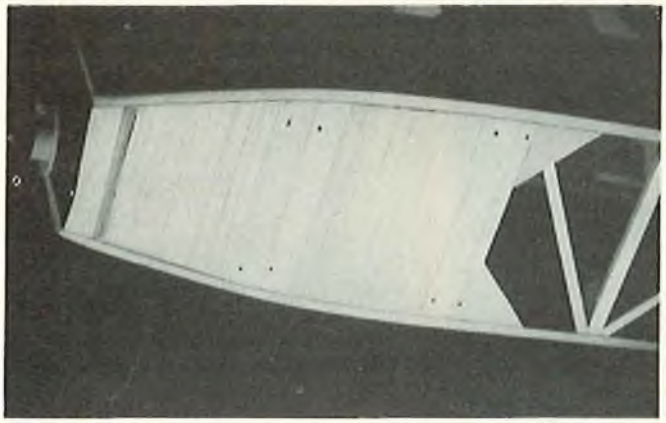
Mid-fuselage pushrod support.



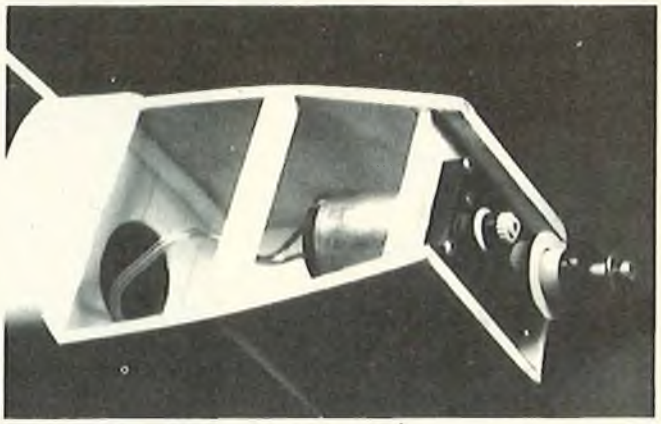
Nose curvature and plywood doubler are evident in this photo.



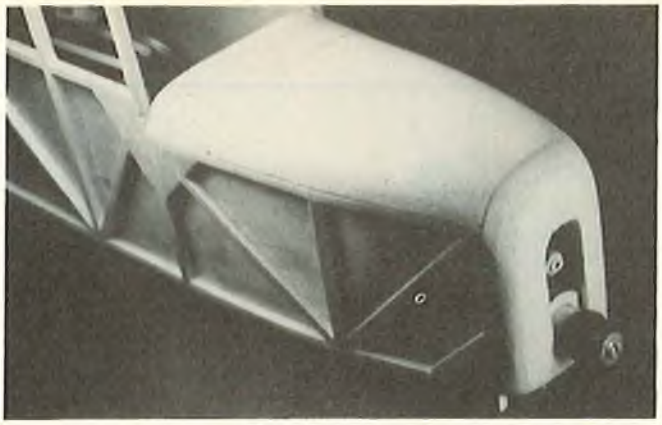
Interior view of nose prior to motor installation.



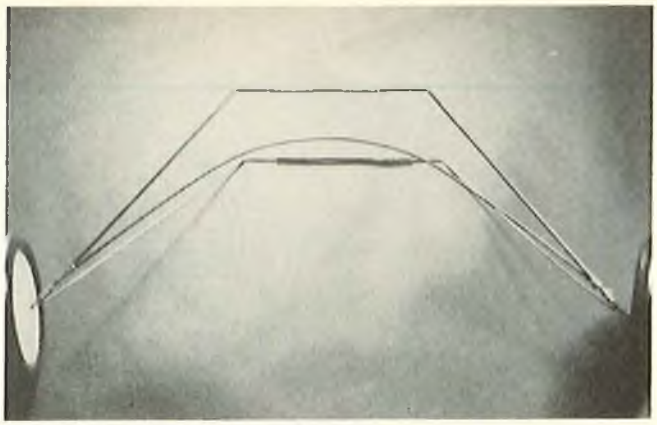
Bottom of nose section showing landing gear mounting holes.



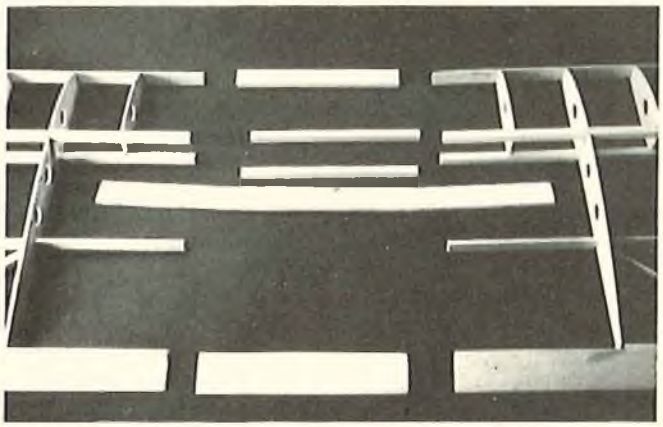
Motor and reduction drive installed. Hatch hold down screw goes into cross member.



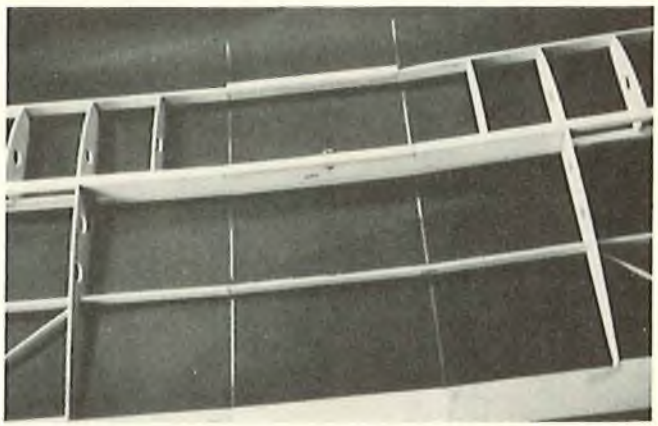
Completed nose section with Astro #4028 belt drive installed.



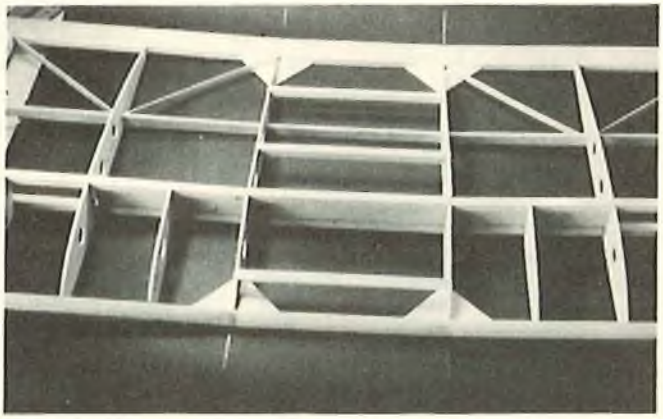
Completed landing gear assembly.



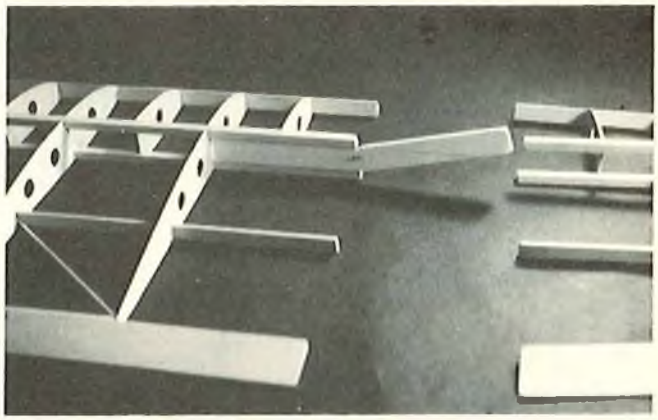
Parts for assembling wing panels at center section.



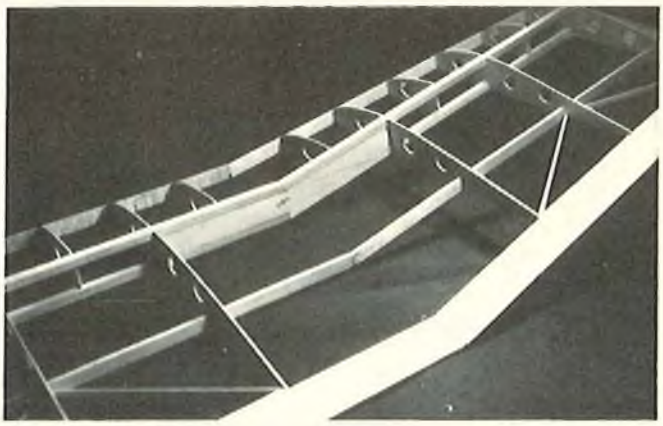
First step in center section assembly.



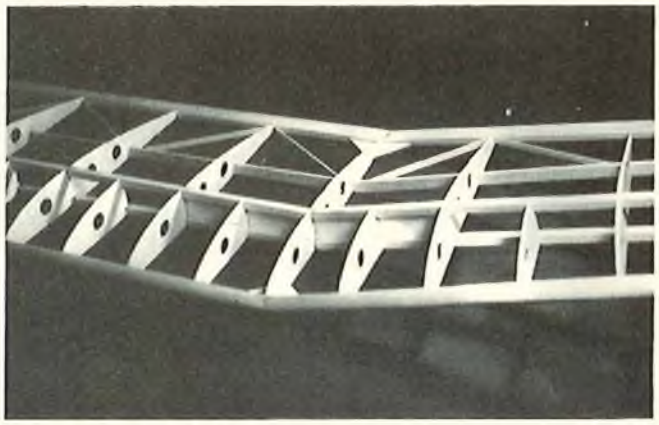
Completed wing center section.



Polyhedral epoxied in inboard panel.



Inboard and outboard panels are joined.



Polyhedral joint is completed.

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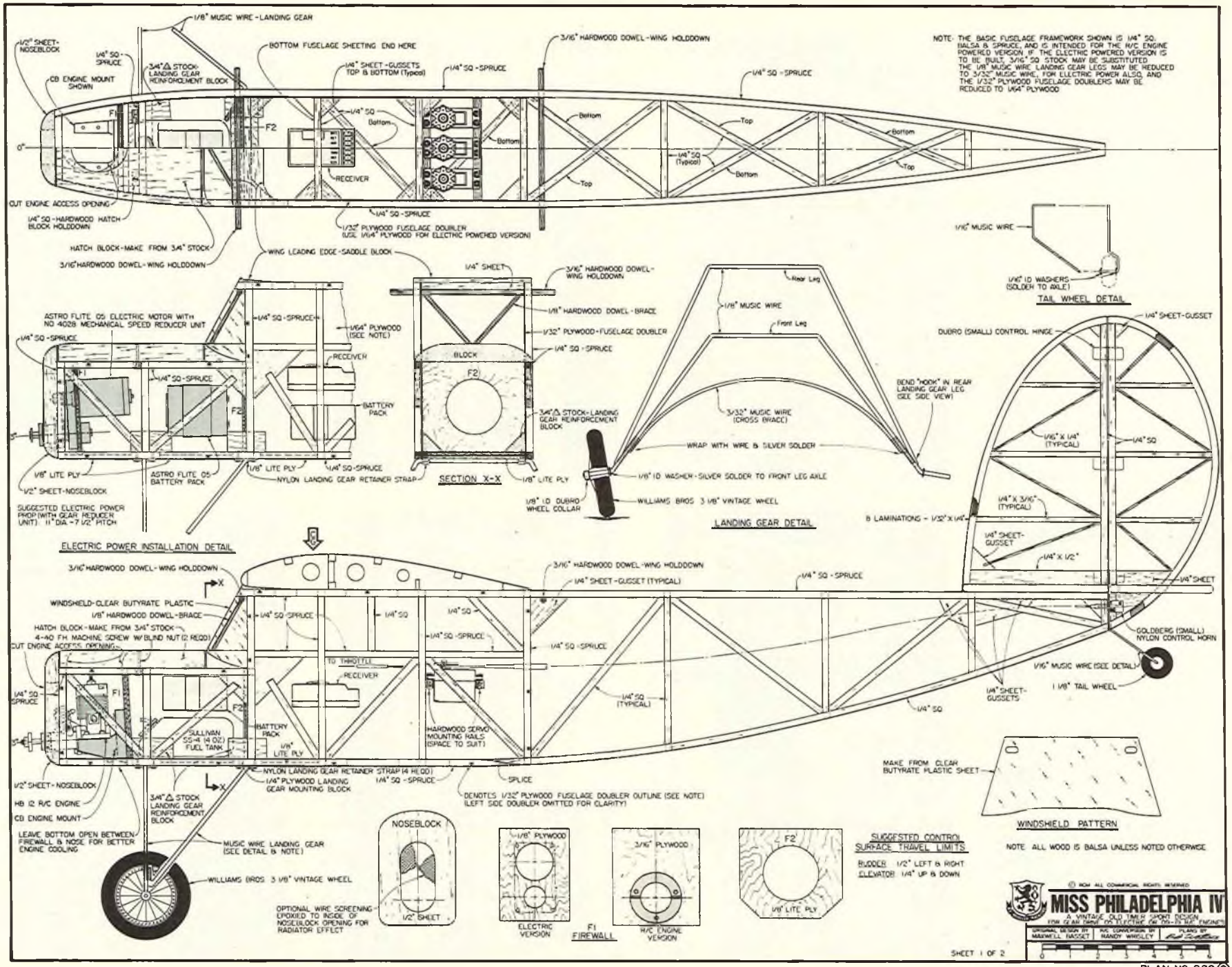
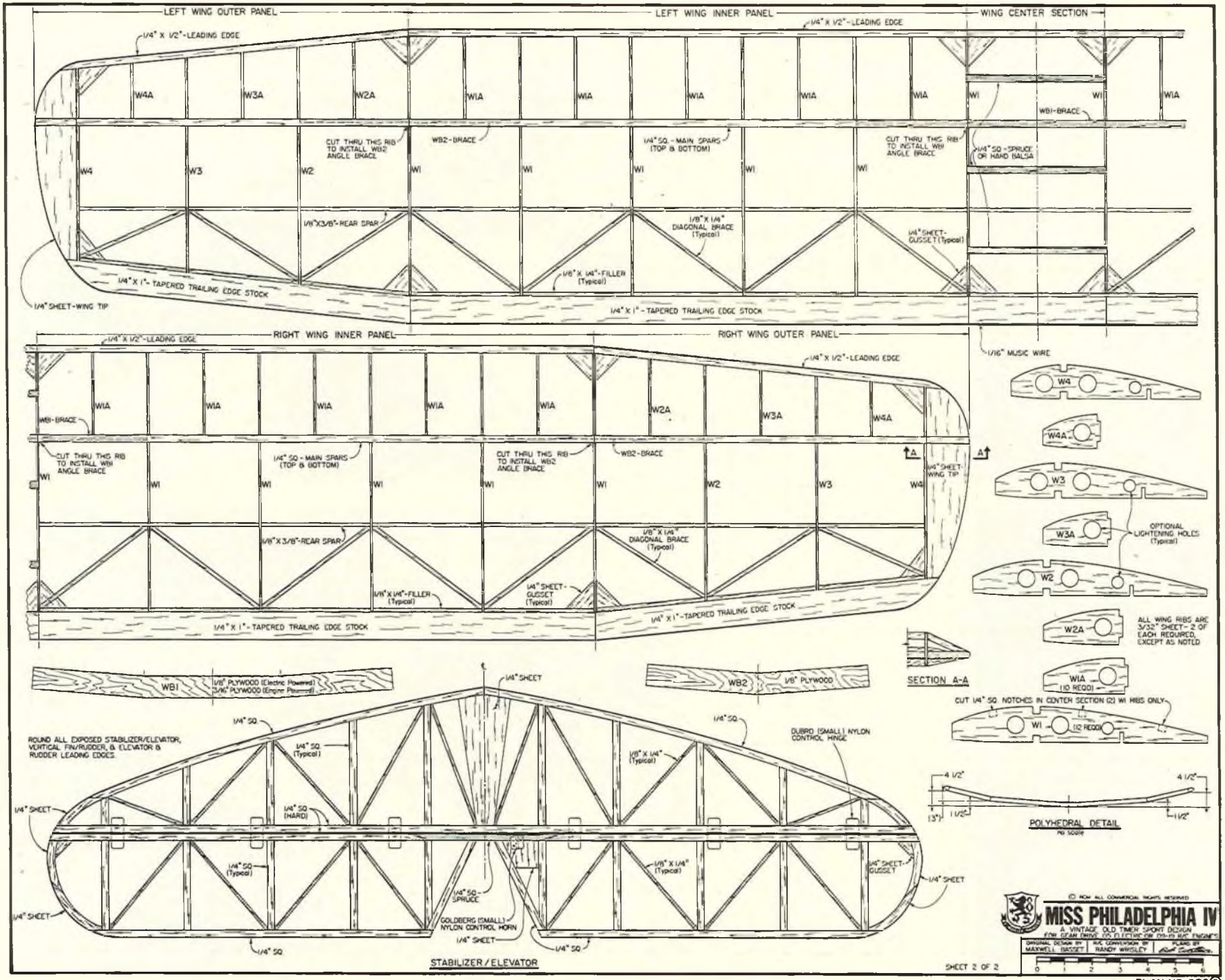
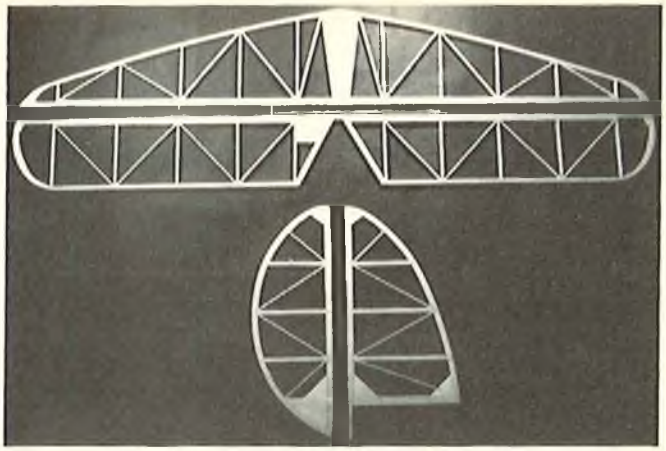
FULL SIZE PLANS AVAILABLE — SEE PAGE 203



PLAN NO. 862②





The tail surfaces are basic lightweight structures.

Screen makes nice grill effect.

already. Next comes the 1/4" gussets in and around the cabin area. Those little monsters really add strength! About all that's left to do is carve the top and nose blocks to shape. Make a tank compartment if you need one. Finally, route the pushrods before covering.

Wing:

Using a plywood template, cut out twelve W1 ribs and ten W1A ribs. Make two each of the tip ribs as well. Lightening holes are optional, but sure look good under transparent covering. Pin the trailing edge and bottom spars down over the plan. Cement the ribs in. We use a soft piece of 1/8" x 1/4" balsa, cemented between each rib at the trailing edge to stiffen the structure. Block up the leading edge to match the ribs and cement it in place. Install the top spar and diagonals. Cut out the three polyhedral braces. WB1 is 1/8" ply if electric power is to be used and 3/16" ply should be employed for conventional R/C glow engine. WB2s are 1/8" lite ply. When the wing is dry, block up each tip 3" and epoxy both WB2s in place.

After the epoxy sets, block up the center panels 1½" each and epoxy

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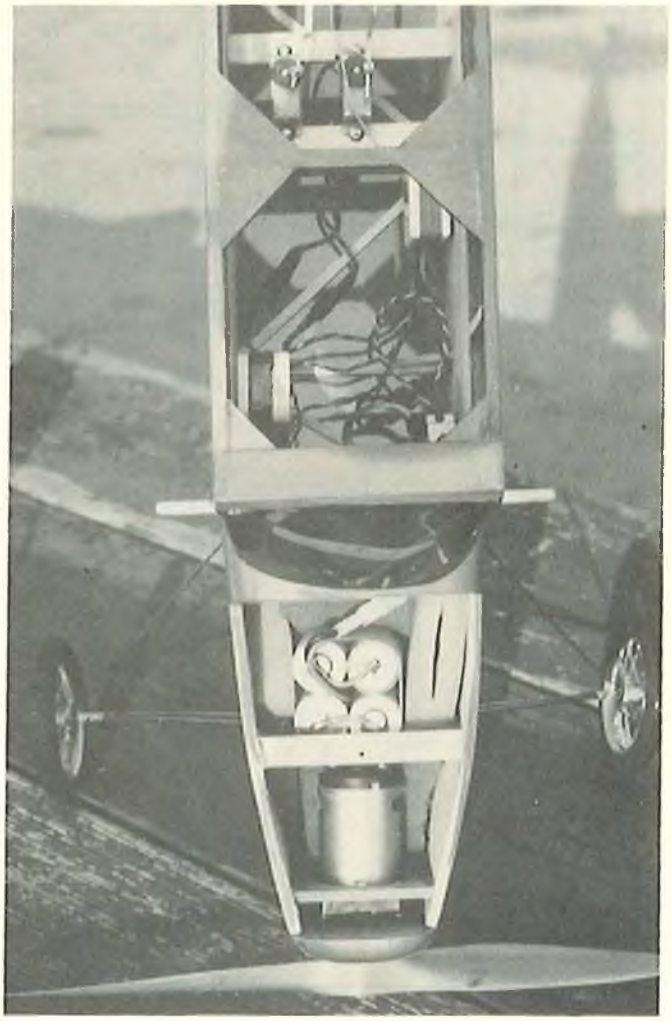
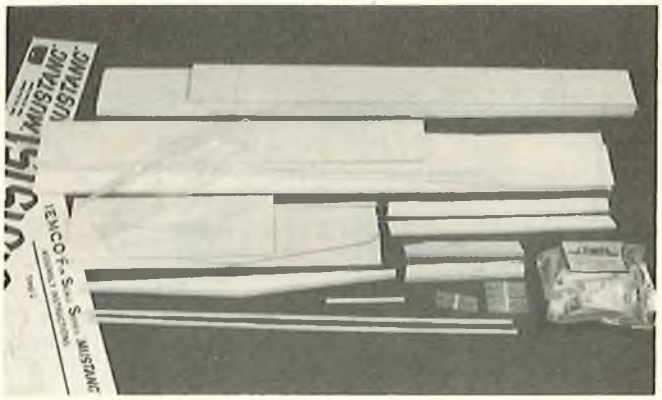


Lots of room for equipment installation.

RCM PRODUCT REVIEW

Mark's Models MUSTANG



SPECIFICATIONS

Name	MUSTANG
Aircraft Type	Fun Scale Advanced Trainer
Manufactured By	Mark's Models 1578 Osage Street San Marcos, California 92069
Mfg. Suggested Retail Price	$44.95
Available From	Retail Outlets
Wingspan	51 Inches
Wing Chord	12½" root, 7" tip
Total Wing Area	490 Square Inches
Fuselage Length	40½ Inches
Stabilizer Span	17⅜ Inches
Total Stab Area	81 Square Inches
Mfg. Rec. Engine Range	.19-.40
Recommended Fuel Tank Size	8 Oz.
Recommended No. of Channels	4
Rec. Control Functions	Rud., Elev., Throt., Ail.
Basic Materials Used In Construction:	
Fuselage	Balsa & Ply
Wing	Balsa
Tail Surfaces	Sheet balsa
Building Instructions on Plan Sheets	No
Instruction Manual	Yes (2 pages)
Construction Photos	No

RCM PROTOTYPE

Radio Used	Airtronics 6 ch.
Engine Make & Displacement	H.P. .40
Tank Size Used	Sullivan 8 Oz.
Weight, Ready to Fly	70 Oz.
Wing Loading	20.5 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:

Appearance of the finished product, the way it flew, excellent instruction sheet.

WE DIDN'T LIKE THE:

Several points in fuselage assembly were off and could result in minor misalignment.

The Jemco Fun Scale Series Mustang (which, for the sake of brevity, we will henceforth call the "Mustang") is an advanced trainer which, according to Jemco, was designed for the novice builder and flier. Well, we'll see.

The kit comes in a 3" x 5½" x 37½" cardboard box, and when opened revealed all small parts packaged in plastic bags, and all sheet and stick balsa bundled and rubberbanded.

Construction:

Jemco has a rather novel approach to instructing the builder and we feel, in this case, it is a good one. The actual plan sheet, 14" x 26", shows only the wing construction. The top view of the right wing is on one side, and the top view of the left wing on the other. The rest of the construction is one of assembly rather than building, and this is covered in 21 steps, using both sides of a 23" x 29" sheet.

Die-cutting, overall, was found to be good, however, several instances occurred where notches or keys did not line up exactly and necessitated either trimming or filling in. The fuselage is built using a crutch as the main support unit, and onto this the bulkheads, sides, top and bottom were applied. It was during the assembly of all these units that several minor misalignments were found ... and corrected.

Before continuing, it would seem like this might be a good spot to comment on Jemco's "Assembly Instructions" sheet. As we mentioned, there are 21 steps covering both sides of the sheet. Each step has a detailed, perspective drawing showing exactly what is to be done. At the beginning of the step is a list of "Items Needed" for that particular operation. For example, under "Items Needed" for Step 1 is, "any glue and pins." Under "Items Needed" for Step 3 is, "5-minute epoxy, 1/8" and 5/32" drill bits, clamps (clothespins), and Kraft motor mount." Following "Items Needed" are the necessary instructions to complete that particular step. We found this method of instruction to be an excellent one and would be of immeasurable value to the "novice" builder (we'll talk more about him later).

Wings are of conventional construction, and went together with little or no problems, as did the tail assembly which was die-cut sheet.

Accessories included in the kit were: decals, control horns and hinges, 4-40 bolts and nuts. Gear door clamps, torque rods, built-in servo rails, and a scale canopy.

Covering:

True to the spirit of this historical plane, we decided to cover it with Super MonoKote metallic silver. The application of decals finished the job, and with a Williams Brothers pilot strapped in, the old Mustang looked like she was rarin' to go.

Engine:

We installed the HP .40, using its supplied muffler, and

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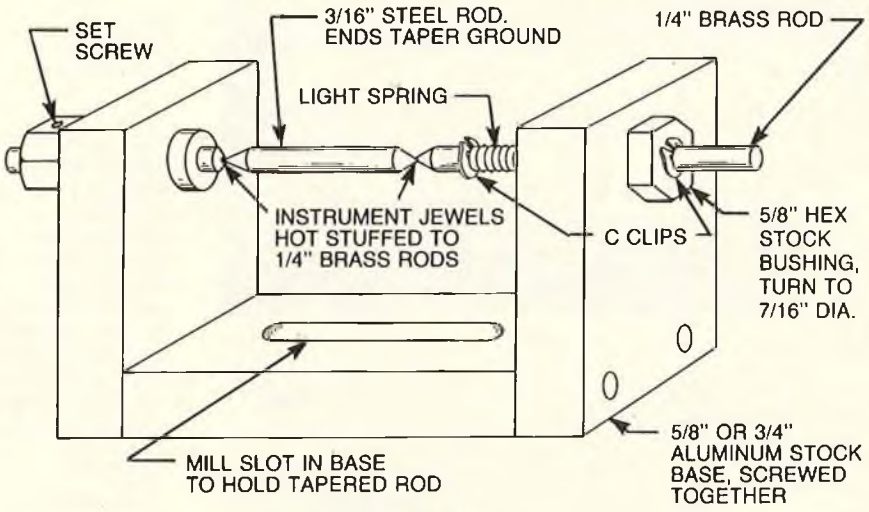
POWER BOATING

Howard Power

Several months ago during a discussion of propellers, I mentioned that all props should be balanced before use. An accurately balanced prop is important because imbalance produces power robbing vibration. Propeller induced vibration can quickly wear out strut bearings and drive shafts. Those of you who run a K & B outboard know that an out of balance prop can very quickly wear out the lower housing bearing. This is not a factory defect. It is a good example of what damage an out of balance prop operating at high revs can do. Rod Geragthy of Seattle, Washington, uses the super accurate prop balancer shown in the figure. It is a simple design that most of you can duplicate. The base can be made of any material but thick aluminum works great because of its stiffness and mass. Five eighths inch thick brass or aluminum hexagonal stock is turned down to 7/16'' diameter for approximately half its length. A 1/4" hole is then drilled through the center so that the spring loaded 1/4" diameter brass support shaft can pass through. This support shaft has two thin grooves machined in it so that two C clips can restrain the light tension spring. The left support is also made from 5/8" brass or aluminum stock and is identical to the right support except that a set screw is used to hold another 1/4" brass rod securely to the base. Each of the 1/4" support rods have instrument jewels soldered or Hot Stuffed to each end. These jewels are the real secret to freely supporting the taper ground 3/16" diameter prop balancing steel rod.

This device will solve all your prop imbalance problems except how to find the time to work on them! When I used this balancer to check some of my "balanced" props, I found that many were not as good as I had thought. Remember that the prop is not statically balanced until it will stop at any position after it is spun. If it always stops at a particular orientation, it is not yet balanced. Remove metal from the portion of the prop that is below the center of the porp shaft until the prop is balanced. Only work on the back or convex side of the prop blades when removing metal to balance.

K & B Manufacturing released their new 7.5cc outboard engine in December. Because of magazine deadlines it was impossible for me to get a photo report on the construction of this engine in this month's column. Hopefully, next month we will feature this new offering from K & B. The performance report will have to wait until we can get a suitable hull built. I'm sure that a host of new hulls will now be developed to utilize this new power plant. From what I hear from K & B, the next marine project will be a racing .67! Look for this engine to hit the market in a few months, if all goes well.



SUPER PROP BALANCER

Those of you who follow full scale boating know that Bill Muncey was fatally injured while racing his Atlas Van Lines unlimited hydro. Bill was probably the most famous boat racer in the world. His loss will be felt for a long time. I received the following letter from Roger Newton who is the NAMBA R/C Unlimited Chairman. Roger has put forth some good suggestions and I hope that many of you will make your feelings known.

For those of you who haven't heard, Bill Muncey, driver of the Unlimited hydroplane, Atlas Van Lines, was killed at the October 18 World's Championship race in Acapulco, Mexico. For those of us who had the good fortune to know him he will be sorely missed.

He had been driving the world's fastest race boats virtually non-stop for four decades. He had won over 60 major regattas, he long ago surpassed the legends established in the sport by Gar Wood and established his own standards of excellence that will probably never be challenged in "His sport."

Throughout his career, Muncey challenged death and for almost 31 years came out on top. Along the way he endured numerous accidents and injuries.

1957 — Miss Thriftway disintegrates in Madison, Indiana — Muncey hospitalized.

1958 — Miss Thriftway loses rudder and hits Coast Guard cutter in Gold Cup race on Lake Washington — Muncey hospitalized.

1963 — Notre Dame catches fire in post season test — Muncey suffers burns.

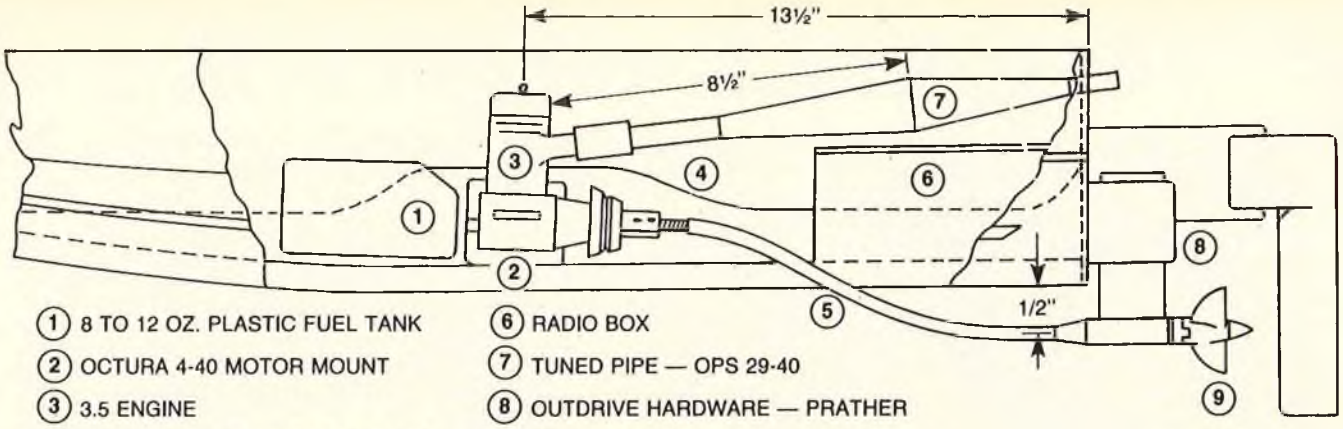
1966 — Miss U.S. spins out in race at Detroit — Muncey finishes the heat despite chest injuries.

1973 — Suffers broken ribs racing outboard tunnel hull in Memphis, Tennessee.

1974 — Atlas Van Lines stuffs nose in Detroit River in pre-season test run — Muncey suffers injuries.

Recognizing the danger, he once called racing "A cruel sport."

I remember Muncey saying prior to the 1977 season that he always feared hydroplanes designed with the cockpit in front of the engine, even though the Atlas was designed that way. In 1957 and 1958, Muncey had driven the Thriftway, Too, first of the cab-over designs used in the sport. "When you're driving up front, you're the first one to



TYPICAL 3.5CC INBOARD SETUP

the scene of an accident," he was quoted as saying.

The 52 year old Muncey, long acknowledged as the sports' all time driving star, won a whopping eight Gold Cups, seven National High Point Championships and four World Championships on the Unlimited circuit. He won every majoy regatta and held every major speed record, both in qualifying and in competition.

Muncey was the thirteenth driver to die behind the wheel of an Unlimited hydroplane since 1951. Muncey's loss will likely leave a vacuum in the sport.

Bill had said that if he had to go, he wanted to go when he was out in front. Entering the second corner on the first lap of the final heat at that race in Acapulco, the Atlas suddenly lifted its nose and danced on its transom for several hundred feet before going all the way over backwards and landing on its top. Bill never had a chance as he was still in the cockpit when the boat landed.

I had a conversation with Herb Stewart the other evening. He was as shocked as everyone to hear of Bill Muncey's passing. Herb feels as I do that we of the model boating fraternity should do something towards the memory of this fine hydroplane driver that we idolized for so many years.

As the NAMBA Chairman for R/C Unlimiteds, I would like to suggest that we do the following: there has been a scholarship fund set up by the Atlas Van Lines Corporation in Bill's memory. If you would send your contributions and remembrances to my address — Roger J. Newton, 14518 167th Pl., S.E., Renton, Washington 98055, I will then, in turn, send a check along with all of the contributors' names to the Atlas headquarters.

The second thing I would like to see next summer is all of the model boat racers, regardless of your affiliation — whether it be NAMBA or IMPBA — hold a race in your district in the memory of Bill Muncey. And it doesn't necessarily have to be an Unlimited race as Bill did indulge himself in other forms of boat racing from time to time. I am going to suggest to our district that we dedicate next season's Gold Cup to Bill's memory.

It will seem very strange next year not to have Bill Muncey driving a boat in the Annual Seafair event on Lake Washington as he had done for the last 25 years.

Sincerely,
Roger J. Newton
Seattle, Washington

Dear Mr. Power:

I have a K & B outboard with an exhaust throttle, mounted on a Dumas Hot Shot. The propeller being used is a JG 3-D-8. The problems I am having are slow speed, cavitation, and nine out of ten times the engine stalls in the first few minutes of the run.

I am considering (1) converting it to a regular carburetor operation, (2) using a Robart Super Pumper Mark IV, and (3) a new prop. Will these modifications solve my problems? Any additional suggestions you can give me will be greatly appreciated.

Yours truly,
Tim Pavell
Woodland Hills, California

Tim, you are using too large, a propeller on your boat. The slow speed is due to the fact that the 3-D-8 prop is loading the motor too much. This results in low rpm and poor performance. K & B outboards have two different piston and liner set-ups. The earlier models had lower exhaust timing and can be recognized because the exhaust port is a single hole in the liner. A high-port timing liner has also been manufactured and can be recognized easily because two exhaust ports are used. The low port timing liner lets the motor develop better low rpm torque than that developed when you use the high port liner. As a result, best results are seen when the low port timed motor is loaded with a propeller that produces approximately 19,000 to 20,000 rpm. The high port liner tends to produce its best power at a higher rpm. In this case best performance will be realized when you prop the motor in the 21,000 to 22,000 rpm range. Many people have had good results with the Hot Shot using a JG E-20 or E-20T propeller. The E-20T is simply a E-20 prop that has its blade area removed from the leading edges. Try these props and your troubles should go away.

I would recommend that you replace your exhaust throttle with the newer K & B outboard intake carb. With use, the exhaust throttle wears so that a gap opens between the exhaust passage and throttle plate. This makes it impossible to stop the engine with the throttle. The throttle plate may be faced off to tighten this fit but this is only a temporary fix. The new carb works much better and since the carb choke area is larger than that of the old venturi used with the exhaust throttle, you will develop a little more power using the intake carb.

You do not need to use a Super Pumper if you install fuel tank pressure as shown in the carb conversion kit instructions. Installation of a pressure fitting in the exhaust passage of the lower unit will supply all the pressure you need for reliable carb operation. Cavitation may be caused by running a propeller at the wrong depth. Most people find that the E-20 and E-20T props work best on your type boat when the centerline of the prop shaft is located 1/4" below the riding surface of the hull sponsons. These props should get your Hot Shot running in the 35 mph

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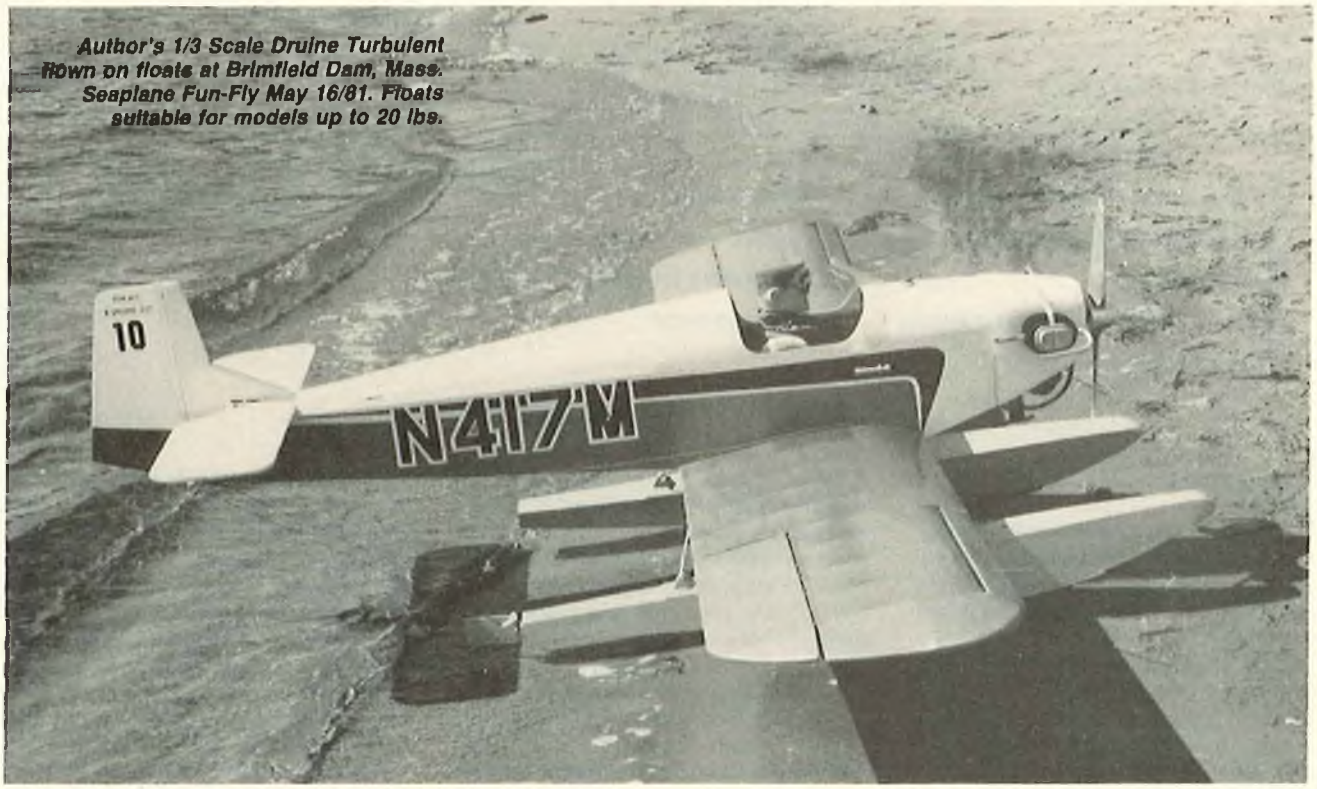
GIANT SCALE



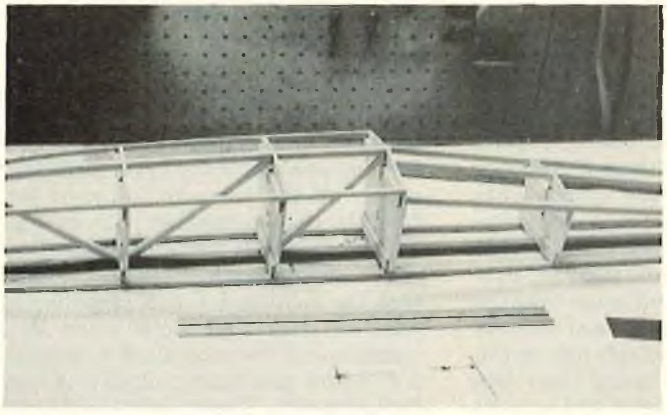
Author's 1/3 Scale Druine Turbulent flown on floats at Brimfield Dam, Mass. Seaplane Fun-Fly May 16/81. Floats suitable for models up to 20 lbs.

FLOATS

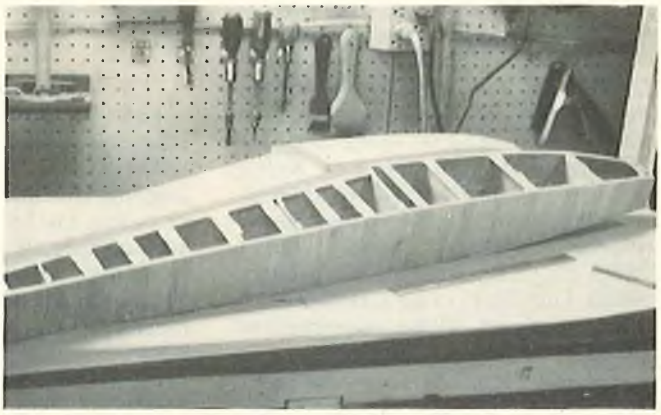
By Doug MacBrien

If you think your giant scale model looks spectacular on wheels, wait till you see it on floats! After flying my new 17 lb. Druine Turbulent on wheels I decided it would be a natural for water flying --- not too heavy, lots of power to get off the water easily --- and proceeded to design what I hoped would be just the right size for this or any model up to 20 lbs. weight on wheels. The results were quite successful --- the model gained only 2 lbs. in gross weight over the land version, and was flown off the water in winds approaching 20 mph at the Brimfield Dam, Massachusetts, seaplane fun-fly on May 16, 1981. Due to a C.G. slightly aft of recommended, the aerobatics were a little wild and unpredictable --- I suggest you watch out for this if you put your big beauty on floats! The Turbulent is very predictable on wheels with the C.G. at about 26% of MAC; at 28% MAC on floats it was something else! Would you believe a flat inverted spin? Ask John Colacci to show you his video tape of the maneuver, if you don't believe me.

The floats were calculated to have a total displacement (volume) of 17 lbs. of water **each**, so it figures they will ride high enough in the water to reduce spray problems, using the same landing gear as that used with the wheels. With a length of 45", beam of 5", and spray rails, they do, in fact, work very well. The 20" Dynathrust prop on the Quadra rarely hit any



Float framed, ready for balsa sheeting.



One float sheeted, the other partly done. Masking tape used to hold balsa in place while glue dries.

spray, even taxiing in the rough conditions at Brimfield. The float attachments are designed to shear off in case of a hard water landing, and this will likely prevent serious damage to the floats. Thanks to pilot error I've "splashed" my Turbulent twice; the floats and aircraft are still undamaged --- needless to say the model got wet! I believe in really waterproofing the radio receiver, and use waterproof servos for continued reliability; my system has worked well so far.

The Turbulent landing gear has shock-absorbing springs which allow the floats to "give," a desirable condition in rough water, but not essential. Since the main load is taken by the front gear (where the wheels normally would be), the aft supports do not need to be nearly as heavy --- 5/32" diameter is adequate, without additional cross braces.

A 2" x 4" plywood water rudder is steered by cables directly from the air rudder. This is effective in "displacement" mode (taxiing at idle in a level attitude, or at 1/3 throttle with the nose high); "on the step" the water rudder is clear of the water. Soft springs or elastics connecting cables to the air rudder are used to absorb possible shock loads to the rudder servo.

CONSTRUCTION

Construction is straightforward, using 1/8" balsa frames with a combination of balsa and spruce stringers, some diagonal bracing in the area of greatest stress. The balsa sheeting may be fiberglassed, or veneered with 1/64" plywood. Again, the planing surface is beefed up, being covered with 1/32" ply.

Construction Sequence:

1. Cut 1/2" x 1/4" spruce, redwood or basswood longerons 43" long, mark positions of frames F1 to F9.
2. Using Xerox copies of the frame patterns, iron these on to 1/8" balsa and cut two sets of frames (grain vertical).
3. Cut notches for longerons and stringers.
4. Glue 1/2" x 1/8" balsa reinforcing x-pcs. on frames.
5. Glue frames in position on 1/4" x 1/2" longerons. Use square.
6. Glue aft keelson and chines (1/4" balsa).
7. Glue top stringers (3/16" spruce) after scarfing together for length.
8. Glue in 3 diagonal 1/4 sq. med. balsa braces on centerline fwd.
9. Glue in fwd. keelson and chines.
10. Glue 1/8" balsa sheeting on bottom forward (grain cross-wise).
11. Sheet bottom aft 3/32" (grain cross-wise).
12. Sheet top 3/32" (grain cross-wise).
13. Sheet sides 3/32" (grain lengthwise). Use masking tape to hold in position (scarf about 3").
14. Glue 1/32" ply "riser" on aft edge of step.
15. Glue on 1/64" ply sides (omit if fiberglassing).
16. Glue on 1/32" ply bottom fwd. in 2 pcs.
17. Glue on 1/64" ply bottom aft. in 2 pcs. (omit if fiberglassing).
18. Glue on 1/64" ply top (omit if fiberglassing).
19. Add 1/8 lite ply reinforcing plates on top.
20. Laminate 3/4" ply and 1/2" ply attachment pylons from birch or mahogany/poplar ply.
21. Drill for axles before cutting out: fwd. pylons 3/16" diameter @ 85°; aft. pylons @ 90°, 5/32" diameter.
22. Cut 3/16" square spruce to length for spray rails. Plane off half, round the front end, and glue on with 5 minute epoxy, using masking tape to hold in position.
23. Mark forward attachment pylons for gluing angle (toed-in) with float held at correct angle and parallel to Datum. 15 minute epoxy in place. Do same for both floats.
24. Bend 5/32" piano wire for aft float strut to pattern shown.
25. Locate 5/32" nylon landing gear clips on plywood so strut is just in front of nylon wing attachment bolts. Harden screw holes with Hot Stuff.
26. With model on cradle (inverted) using inclinometer or level, locate attachment points for aft ply strut attachment pylons to make floats parallel to Datum of aircraft. Remove from model and 15 minute epoxy in place.

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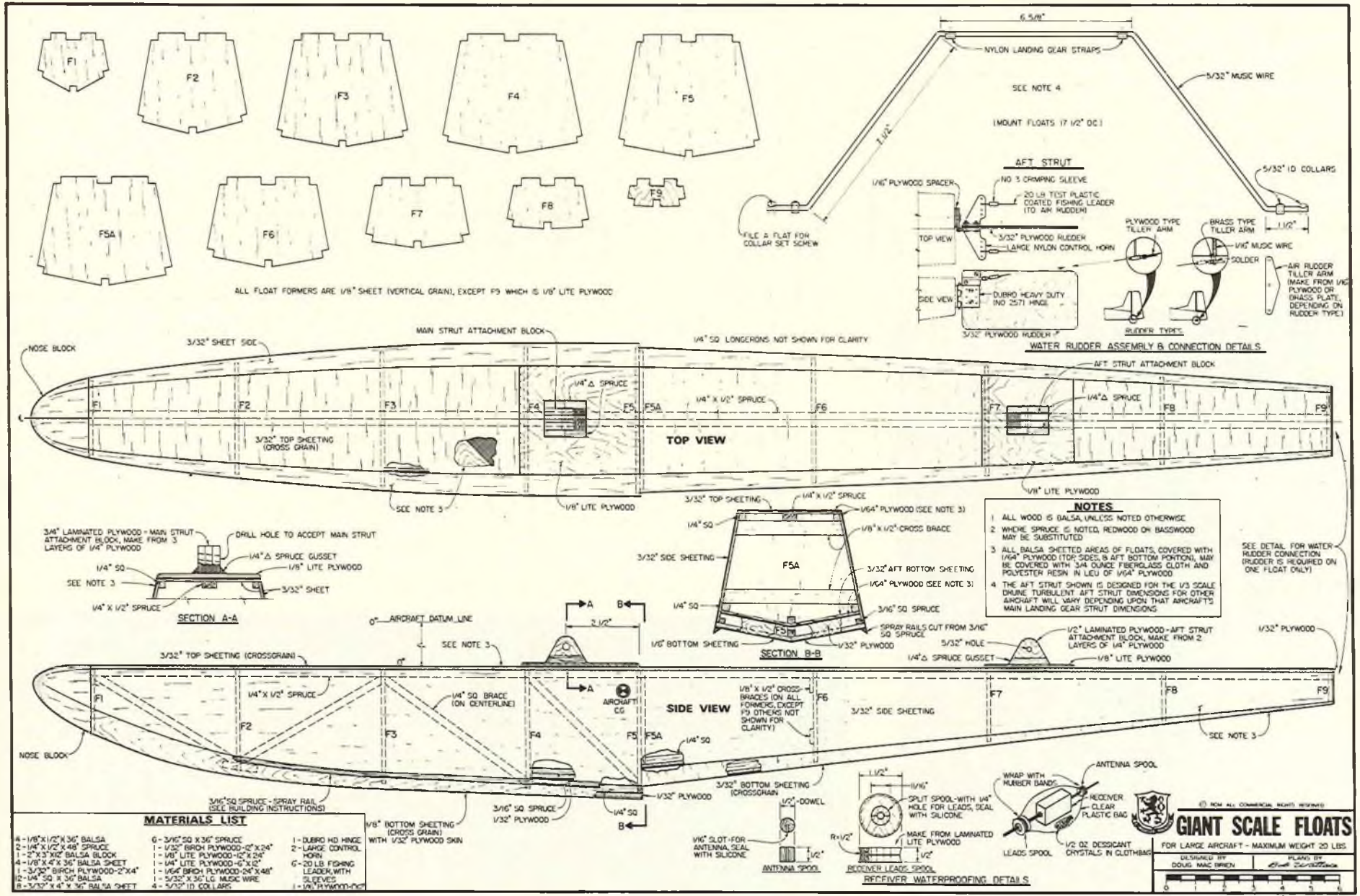
Materials List

- 1/4" x 1/2" spruce, redwood or basswood, 2 ea. 43" — (longerons).
- 2" x 3" x 2" medium balsa block, 2 ea. — (nose-blocks).
- 1/8" x 4" x 36" medium balsa, 4 ea. — (frames, bottom sheeting).
- 3/16" sq. x 36" hard balsa, 6 ea. — (stringers).
- 1/4" sq. x 36" medium balsa, 12 ea. — (chines, keelsons, braces).
- 3/16" sq. x 36" spruce, 6 ea. (chines, spray rails).
- 1/8" x 1/2" x 36" balsa, 4 req'd. (cross braces).
- 3/32" x 4" x 36" med. balsa, 8 ea. (side, top and bottom sheeting).
- 1/64" ply 2' x 4' (veneer covering)
- 3/4 oz. glass cloth, resin (protective covering). Choose option between veneer covering and protective covering.
- 1/32" birch ply 12" x 24" (fwd. bottom covering).
- 1/4" birch or mahog/poplar ply to laminate attachment pylons 2" x 2½" (10 ea.).
- 1/8" lite poplar ply 4" x 4½" (2 ea.); 3" x 3½", 2 ea — (attach. plates).
- 5/32" piano wire, 1 ea. 36" (aft strut).
- 5/32" wheel collars, 4 ea.
- Du-Bro heady duty hinge (no. 257), 1 req'd. — (water rudder).
- Large control horn, 2 req'd — (water rudder).
- 3/32" x 2" x 4" birch ply, 1 req'd., (water rudder).
- Super Jet glue, aliphatic resin, 5 min. epoxy, 15 min. epoxy, mask. tape, Hot Stuff.

Completed floats ready for painting. Attachments designed to shear off the floats in case of a hard landing to reduce damage.

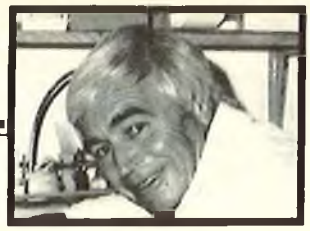
FULL SIZE PLANS AVAILABLE — SEE PAGE 203



PLAN NO. 863

GIVE IT A WHIRL

John Gorham



This month will be a short column since this is about the busiest part of the year for those of us involved with R/C model helicopters — trade shows, the aftermath of Christmas, preparation for the flying and contest season, etc.

First, I'd like to cover some of the correspondence which has come in during the past few weeks. Tom Gibbons of Summerville, South Carolina, is a regular correspondent and provides good inputs for me to keep in touch with what's going on around the country in R/C helicopter flying. Tom's most recent letter describes the 1981 Statesville meet, held in South Carolina, but I have already covered this in a recent column so I won't repeat it again here. Anyway, thanks, Tom, for your inputs, and by the way, Tom's telephone number is (803) 873-9113. He says he will be very happy to help any of you in the area who are experiencing problems in learning to fly helicopters.

The next letter is from David Shema of Bozeman, Montana. Dave writes:

Dear Mr. Gorham,

I could have started off "Dear John," but who needs one of those letters so soon after Christmas! I recently subscribed to 'RCM,' mainly because of your column. I have been attempting to fly choppers for quite a few years. All chopper columns in mags are pretty good and informative. Yours made me take the plunge and subscribe to 'RCM' — I've been threatening for a long time but it took a chopper column to make me do it.

I've noticed that you are printing names of people who are willing to help the beginning R/C chopper pilot get into the air in as few pieces as possible. Heaven knows I could have used someone like that all along.

Maybe a little background is needed. I have been trying for years and years to get an R/C chopper off the ground, only having success in the last 18 months.

If anyone knows the kinds of troubles and ribbing the neophyte heli pilot has to contend with, it's me!

I started with a 'Du-Bro 505.' What a machine! By the time I ended up with a 'Super Tiger .46,' with an 11/7½ prop on it, I decided that the '505' never really did fly. All those pictures in the mags of the '505' "tethered" were done with mirrors. (I am convinced that the tethers were not holding the '505' down, but were, in reality, holding it up!)

(Note by J.A.G. — I agree with Dave on the problems of flying the '505' but it really was the machine that started it all off in this country and there is no doubt that Dave Gray and his '505' helped to lead many of us into R/C helicopter flying.)

Dave Shema then continues with history of his own flying efforts and finished up his letter saying that he is now successfully flying R/C choppers and feels that this will be a lesson to ". . . those club members who were about ready to have the guys in the white suit with the butterfly nets, come and get me." Dave also puts a small footnote on his letter: ". . . perserverance pays off."

Thanks a lot, Dave. Letters such as yours remind many of us of our own efforts during the very short history (ten years!) of R/C helicopter flying. It really is a lot easier now, though, fellas (and girls).

At the time of writing this column, the first major meet of the year, the Fourteenth Annual Tangerine International R/C Championships has just finished. This meet is held every year in Orlando, Florida, and features helicopters as an important element. I was not able to get there myself so I can only report from heresay that at least 40-50 R/C helicopters appeared on the field and a good time was had by all.

In an earlier column, I pointed out that there seemed to be a decreasing interest in the "hot rod" aerobatic machine and an increasing interest in smooth, realistic flying, preferably with helicopters that look more like the real ones. This is a natural evolution to happen. After all, if it hadn't been for some of the earlier "hot rod" fliers demonstrating that helicopters really could do more than just hover and stumble around in one spot, we would probably not have the R/C model helicopter developed to the point it is now. However, the market now seems to be changing to a demand for simple, rugged machines on which a beginner can learn to fly. Then he will go either toward scale ships or semi-scale but more aerobatic machines.

With this in mind it seems that, to attract people to the R/C helicopter meets, we must provide something more than the opportunity of watching a handful of advanced aerobatic fliers competing with each other for two solid days. I have given much consideration to what sort of event is needed to attract the many, many R/C helicopter fliers in this country to gather together, swap notes, have fun, and maybe compete a little. I finally concluded that we should have a new annual meeting which would last for at least a full weekend, maybe longer. We could call it the "Great R/C Helicopter Fly-In," rather than a competition. Imagine a meet which would feature a short competition designed to test the expert's ability to fly smoothly and emulate the flight of the scale machine, much more than we do in our present "Expert" events. A trophy and a significant cash prize would help to bring 'em in. Having got the experts to the field, the main purpose of the meeting would be to encourage active participation by the learners and the tyro fliers. How about, once we have these experts from all over the country (and perhaps the world) gathered together, that we would help to fund the meet by having a continuous "rent an expert" activity. The idea would be for anybody present to buy a numbered ticket which would entitle him or her to, perhaps, ten to fifteen minutes of an expert's time in helping to trim his machine and show him some of the "tricks of the trade," or help him with specific problems he is having? When the ticket owner had his number called and he would be matched to one of the available experts who would then work with him for the allotted time and devote full attention to his problems.

I figure that we have not, so far, attracted the beginner flier to our meets as well as we could. Certainly we cannot expect beginners to drive or fly hundreds of miles just to stand and watch a few experts battle round after round for a trophy. Maybe when we have many more R/C helicopter fliers capable of 'expert' flying, there will be more interest in these events. With all this in mind, I am working on plans to organize such a meet, to take place this year, and I'll get more information to you in the next column.

Now the shows have also started for

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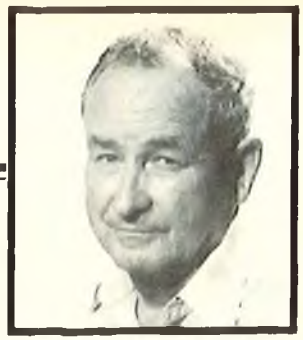
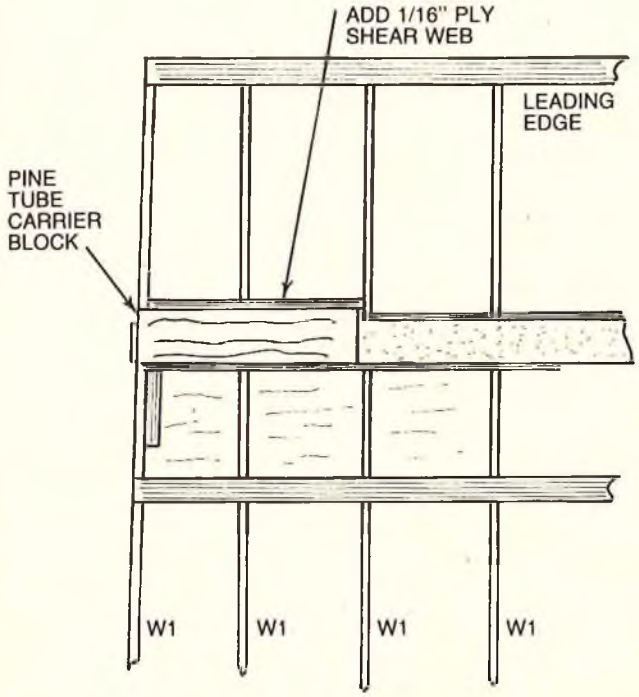
SOARING

Al Doig





DON EDBERG'S SAGITTA WING MODIFICATION

If you are planning a trip to Merrie old England this year, the following notice may be of interest.

Dear Sir,

World Inter Glide — to mark their Tenth Anniversary, the British Association of Radio Control Soarers are to hold a World Thermal Soaring Contest at the ancient English medieval town of Warwick, on the weekend of August 7-8, 1982. This contest is open to any competent radio control thermal soaring pilot, but entry is restricted to 100, with preference given to overseas fliers. The contest will be flown to British Thermal Soaring rules which, unlike F3B, are based purely on thermal soaring. Copies of these rules are available on application to the address given. Further details are to follow, but we would be obliged if you would notify your readers of this coming event, together with my name and address, should individuals require more information.

Yours faithfully,
Al Wisher
21 Williams Terrace
Daventry
Northants NN115ER, England

The restriction "competent R/C thermal soaring pilot" may disqualify me from entry, but I may try to bluff my way in anyway.

★

In the January issue I ran a couple of pictures from the Great Race, sponsored by the SOAR club. While I don't usually report on individual contests, the huge sailplanes used in this one deserved some attention. Anyway — at the time I didn't have a picture of the winner, Pat Flinn of the Greater Detroit Soaring & Hiking Society. Now I do, so here it is. Pat completed 14 miles of the course in 55 minutes. The total course is 76 km (47 mi) long. Flying the FAI ship used in the World Championships, the South African team of Andy Keil and Nord Gerneke were in first place on Saturday, but couldn't better their 3.2 mi run on Sunday and finished fifth.

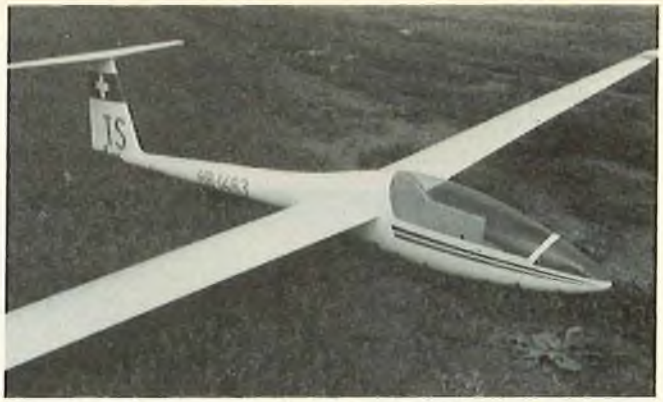
★

I am always interested in the types of sailplanes being flown in various parts of the country. So, I was interested in some pictures sent by Gordon Stratton, President of the Long Island Silent Flyers. The pictures were of the 1981 Eastern Soaring League Contest. Looks like polyhedral dominates on the East Coast, as it does in most parts of the country. I notice several aileron sailplanes. Ailerons are showing up more and more at flying fields all over; with the Pacific Northwest leading the way.

★

An apparent structural weakness has caused the demise of a number of Sagittas around the country. Failures occur during a winch launch, with the wing rod breaking out of the spar at the wing root. The wing tubing for the wing rod is epoxied in a slotted pine carrier block. The rear side of this pine block is strengthened by a ply shear web. The front of the block depends, however, on the strength of the block and the epoxy. The block splits under load — and kapow. The problem is compounded by a very short wing rod. Don Edberg, member of the U.S. Soaring Team, has published a recommended solution in several newsletters. A 1/16" plywood shear web is epoxied to the front of the pine carrier block to prevent its splitting, as shown in the drawing.

1981 Eastern Soaring League contestants and their planes. Photo by Coulter Watt.



Meyer Gutman's winning scale LS3 1981 Eastern Soaring League Contest. It lands at 30 mph with full flaps. Photo by Coulter Watt.

I contacted Lee Renaud, of Airtronics, about the problem. It was Lee's understanding that the failures were occurring after a hard landing which might have started the split in the block. He, however, is going to modify the drawing, and the kits. I guess it doesn't really matter how the failure starts, if it ends in disaster.

★

I hate it when columnists run letters from readers. It is a cop-out as it fills the column with no effort on the columnists part. Which is a neat idea, so here goes. Jim Benson (JB), Secretary of the Grand Valley Radio Control Club, Nunica, Michigan, wrote a very perceptive letter on the subject of 2-Meter sailplanes. I tried to condense it, but couldn't without losing some good thoughts.

Dear Al,

I can't recall seeing the attendance figures for the Two Meter World Cup (61 in 1981, Ed.), but I believe they have been better than ours. Perhaps you could help me do some long distance brain picking with the organizers and compare thoughts. In 1980 I organized a one-day, duration task, 2-Meter contest on September 28. Twenty-five contestants entered. The 1981 contest was two days, two duration tasks, a speed/distance task, and two separate landing requirements, on August 22 and 23. Attendance was 11 and 15. Comparisons of the number of entries brings to mind apples and oranges, but right now I am leaning toward a one-day duration contest similar to the first one. The question then would be whether anyone would be encouraged to put any effort into new designs emphasizing L/D performance. I believe the result would be a minimum-sink contest in which the winners would be those lucky enough to encounter lift over the launch area.

I have concluded that in order to have a decent participation in a contest of this type, (i.e., one stressing performance — Ed.) there must exist a base group of knowledgeable, active fliers who are putting much effort into 2-Meter development. That group does not exist within 150 miles of our contest. If large scale attendance is desired, I must gear contest tasks to the lowest common denominator. Ninety-nine percent of the 2-Meter fliers locally and, I believe nationwide, are interested only in the most fun per kit dollar. They fly the 'little airplane' for fun. When they get serious, they haul out the 'big bird.' 2-Meter airplanes are cute. They don't fly as well as the big ones. Nobody buys a 2-Meter kit with winning contests in mind; they want to have fun. Will the 2-Meter airplane ever be taken seriously? Smaller cars and thinner wallets tell us something. The recent advent of new kits bodes well for the class, but there are multitudes of fliers who still insist that regardless of features and quality, a 2-Meter kit should sell for half of what a larger kit is worth. Most of the kits appear to be designed to fit in a certain price range, but the same engineering goes into them; they have the same number of parts, only smaller ones.

Another factor seems to be the large number of fliers to whom thermalling with a large sailplane is more than challenge enough. The jaded fliers are the ones taking up the challenge of

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World Champ Dwight Holley flew his "Gobbler" in the 1981 Eastern Soaring League Contest. Photo by Coulter Watt.

Pat Flinn, Greater Detroit Soaring & Hiking Society, winner of Great Race VI. Plane and flier has won 3 years in a row.

Andy Kell and Nord Gerneke of South Africa with Nord's design and Great Race VI entry. Nord also flew same entry in Sacramento World Championship.

RCM PRODUCT REVIEW

Hobby Lobby HI-BOY 4

SPECIFICATIONS

Name	HI BOY 4
Aircraft Type	Sport Plane
Manufactured By	Hobby Lobby International 1 Franklin Pike Circle Brentwood, Tennessee 37027
Mfg. Suggested Retail Price	$69.50
Available From	Direct from Mfg.
Wingspan	59 Inches
Wing Chord	9 Inches
Total Wing Area	523 Square Inches
Fuselage Length	43" (incl. spinner)
Stabilizer Span	22 Inches
Total Stab Area	132 Square Inches
Mfg. Rec. Engine Range	.25-.40 Cu. In.
Recommended Fuel Tank Size	6 Oz.
Recommended No. of Channels	4
Rec. Control Functions	Rud., Elev., Throt., Ail.
Basic Materials Used In Construction:	
Fuselage	Ply
Wing	Foam & Obechi Wood
Tail Surfaces	Balsa
Building Instructions on Plan Sheets	No plan sheet
Instruction Manual	Yes (2 pages)
Construction Photos	No (drawings)

RCM PROTOTYPE

Radio Used	Kraft
Engine Make & Displacement	K & B .40
Tank Size Used	8 Oz. Sullivan
Weight, Ready to Fly	76 Oz.
Wing Loading	20.9 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:
Obechi wood, covered foam wing.
WE DIDN'T LIKE THE:
See text.

The precedent kit Hi-Boy 4 is a high wing aileron sport plane and trainer and comes in two versions. One with an obechi wood covered foam wing, the other with a built-up wing.

The fuselage is all ply and may be snapped together in 4 minutes using rubberbands as adhesive. One evening is all it takes to build the fuselage, another to assemble the two piece wing and the empennage. Covering and adding the radio gear should take a couple more. One week of evenings will have the plane ready to fly for the fairly skilled builder. It will, of course take the beginner or intermediate builder somewhat longer.

Since most of the plane is plywood or wood covered foam, packaging of the kit is no real problem. Upon opening the box, you will see the wings padded with the foam from which the wing was cut. Most of the remainder of the kit comes in flat plywood sheets. The very complete hardware set is packaged in neat plastic envelopes. Everything right down to the plastic clevises is included in the kit. All you need extra is a radio, covering materials, and adhesives.

Construction:

The whole fuselage comes in die-cut ply sheets, the die-cutting is good, only a little work with a No. 11 X-Acto blade is necessary in the tab and notch area. You should first assemble the fuselage without glue to see how it fits together. The top and bottom rear sections key to the sides to eliminate a warped fuselage. The servo tray, an integral part of the center of the fuselage gives strength and assures that parts remain true and square. When you are sure that everything fits, then assemble with aliphatic glue using masking tape and rubberbands for clamps.

While waiting for the fuselage to dry, cover the plans with a plastic sheet or waxed paper and lay out the fin and stab. Glue and pin in place.

The next building session involves the wing. Capstrip the dihedral braces with 1/8" square balsa. Using 5 minute epoxy, coat the slots already cut in one section of the wing and insert the dihedral braces allowing a little of the balsa to stick up top and bottom. If you feel you cannot do the job in 5 minutes, use a slower setting epoxy. When dry, add the other half wing. The bevel on each inner end of the wing halves will give you the correct dihedral. The trailing edge pieces are already cut to shape and length, just glue in place. The wing tip sheeting is balsa. Since the covering of the wing is obechi wood, it is a little more difficult to sand than one covered with balsa. Like any hard wood, you should start with a fairly coarse grade of sandpaper and work to a very fine grade. You will really be impressed with the strength of this wing.

The aileron horns are a little different than the standard ones we know. They must be soldered and bolted together. A small square hole must be let in the center of the trailing edge of the wing to allow movement of the aileron horns. Be careful bending the aileron torque wires where they enter the ailerons; we bent it too sharply and it snapped. Matching the wire gauge was impossible so the threaded

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BIG IS BEAUTIFUL

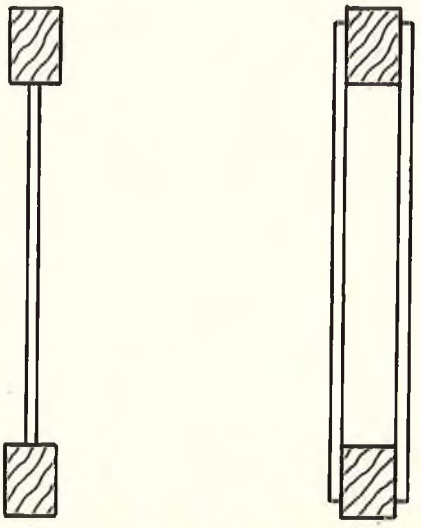
Dick Phillips

You may recall I mentioned a couple of months ago that I would make an attempt at telling you how to modify a kit or convert a plan to handle the power of the larger gas engines. We talked about tail feathers and I said I'd talk about wings this time. We'll go on to other assemblies and some additional general stuff in future columns.

I'll almost always change the wing spars to one of the softwoods. Now that opens up something I had not thought of before. I was reading in one of the other magazines recently about a kit conversion for the Quadra engine and the author referred several times to hardwood. Let's get something straight about woods. Softwoods are woods such as Pine, Cedar, Spruce and the like. Hardwoods are Maple, Oak, Walnut and many others. Most hardwoods are both too heavy and too hard to work easily for our use with the possible exception of maple motor mounts like we used to use in control line models. Balsa, would you believe, is scientifically classified as a hardwood by virtue of being a leaf bearing tree whereas softwood trees have needles. However, Balsa is certainly a soft wood, but not in the same class as the softwoods we are now using in Quarter Scale construction. We can change from balsa to the softwoods mentioned above in the same dimensions as specified for the balsa and provide a great deal more strength with a minimal increase in weight, and that's what we're after for the construction of large models.

So, by using the same size material specified in the kit or plan, we can use spruce or cedar or pine and gain really significant strength without a serious weight penalty. Then, even if not specified in the kit or plan, I tend to web the wing structure at least as far out from the root rib as the strut support bay. For those of you not familiar with the term, webbing a wing means providing greater support to the spar structure by gluing pieces of sheet material, either balsa or plywood, either on the front and/or rear face(s) of the spars, between the wing ribs or between the top and bottom spars, also between the ribs.

The sketches above illustrate webbing. Sketch A shows the web material placed between the spars.



The web may be made of sheet wood and can be balsa or whatever you wish, but the grain must run vertically. Plywood may also be used and the majority of the grain should be vertical here as well but this is less critical than with plain sheet wood. Sketch B shows the material glued to the faces of the spars and the web may be added to both front and rear of the spar as shown, or may be added to either. As shown, a box spar has been created and it is a great deal stronger and resistant to flexing than the two spars would be by themselves. Webbing at least as far out as the strut support plates on a monoplane, or as far out from the root as the interplane strut on a bipe, will add very significant strength to the wings involved whatever the material used. The very slight increase in weight will be negligible when considered against the increase in load bearing capability.

There are advantages and disadvantages to each of the methods shown. The interior web is easy to do, adds great strength and uses half as much material (and adds half as much weight) as the double web. The double web makes a very strong box spar, adding more strength than the single web but uses more material and adds more weight. One of the advantages of the interior web is that, as the wing is being built, the bottom spar is laid down on the plan, the ribs are assembled to it and positioned vertically, being glued as they are added. Then the webs are cut and fitted so the top of each web is just even with the bottom of the rib's spar notch. A bead of glue can then be laid down along the top of the web and the top spar added. Makes for a nice tight fit and a much stronger wing. The double faced web, on the other hand, is harder to glue in place as it has to be held while the Hot Stuff sets or you'll have to find a clamp that will hold the web tightly in place while the glue is drying. The old clothespin trick works well here.

Both front and rear spar may be webbed and the subsequent increase in strength is really worthwhile. Most of our large models have front and rear spar pairs, and the slight weight increase to do both is worth it.

When I mention plywood for the webs, I use a lot of 1/32" and 1/64" ply in my contruction and I save all the cuttings to make gusset plates (more later) and also to make the small web plates. I prefer the 1/32" for webs and find that I can get enough of them out of the scrap I save to do my wings. The plywood cuts well with a modeling knife or a pair of scissors and makes very strong webs when glued into place. Remember the major part of the grain, vertical if using plywood and **always** vertical if using flatwood. So much for the spars, now to the rest of the wing structure.

For ribs, you can stay with those supplied with the kit or recommended on the plan as far as material is concerned. They should do quite well. I do, however, make a few changes to most kits or plans. Any rib that has a function other than simply holding a shape, I'll change to plywood, usually door skin or some similar material. I include here ribs which have to support an aileron bellcrank plate, for example, and there should be a couple of root ribs made of plywood as well. Again, great strength increases with only minor weight penalty.

Leading edge material is a personal choice. If the model is to be a fairly gentle machine, balsa is fine and it is easy to work. If the model is to be flown aerobatically, I will often change the leading edge material to cedar or redwood which is very much stronger than all but the hardest balsa but is still reasonably easy to shape. Going that far is a bit of overkill, if you have webbed the spars, however.

Wing tips are usually balsa sheet

and I tend to laminate them out of spruce strips cut to the appropriate width, and I then laminate enough of them to provide the thickness called for. I do this as much as anything else as they are very strong and highly resistant to damage, especially hanger rash! (I do models more harm getting them to the field than anywhere else!)

Many models use dowels to assure proper line up with the cabin top and, where this is the case, I usually enlarge the normal 1/4" dowel to 1/2", then screw closed eyes into the dowel, slotting the cabin top hole to accommodate the shape of the screw eye. This then provides one of the safest wing hold-downs you'll find. A pair of small turnbuckles is then slipped over the screw eyes, tightened down, and you have a wing secured so that it can't come apart unless you have a major class disaster. It's a good idea to provide a lock nut on the right hand threaded part of the turnbuckle just to make sure it cannot come loose in the air. The turnbuckles join the two wing halves and, if the turnbuckle is too short, I bend a set of wire extenders in order to be able to reach across the cabin area with the small turnbuckles I use.

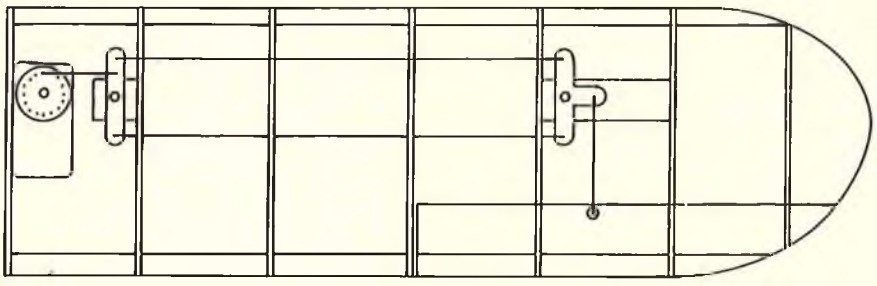
Usual strut mounts consist of blind nuts mounted in plywood plates in the wing and I see no reason to alter that. It's a good solid method of attaching the strut to the wing. The only thing I do in this area is to use socket head screws so the screwdriver can't slip off the head of the screw and punch a hole in the wing. (Remember me? I'm the guy who does more harm on the ground than in the air!)

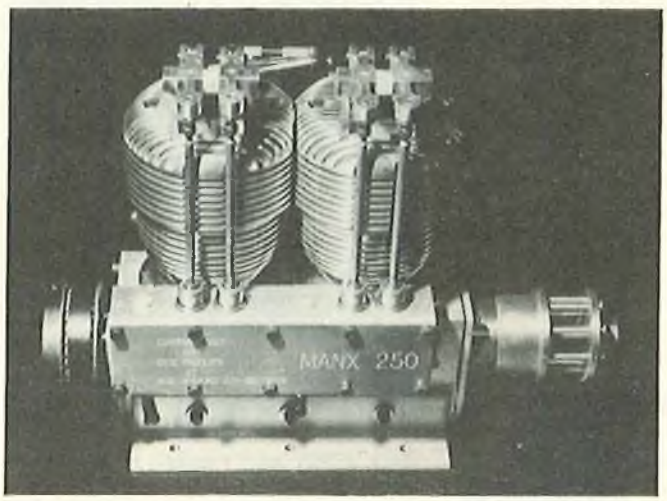
My favorite servo hook-up in a wing consists of one servo to every surface and I prefer not to use long servo leads, so I mount the servo near the root rib, making for a short lead from the servo to the receiver and for ease of mounting and dismounting the wing. (It's a lot easier to hook up a servo lead than to reconnect a changeable pushrod every time you go fly.)

The sketch shows the set-up and it also illustrates another of my favored methods. Wherever possible, double drive to the bellcrank or control surface. This may be soft or hard wire or Gold-N-Rods, although if the run is long, you may be subject to expansion / contraction readjustments from time to time as temperature changes. This type of control hook-up gives positive control, especially if hard wire is used and gets away from the power drain problems and fuss of installing choked leads.

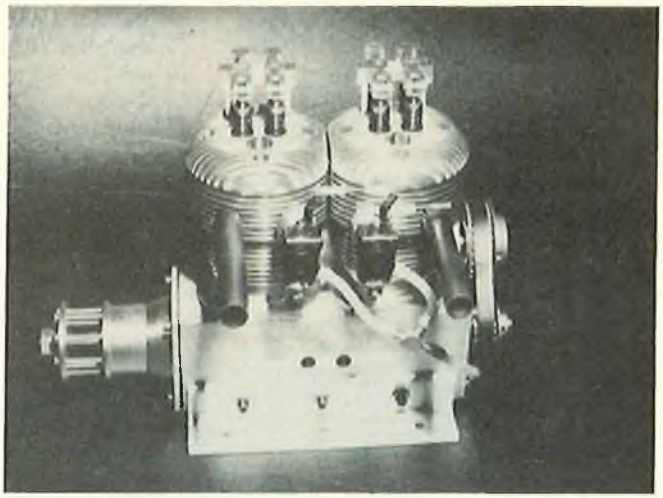
Struts are about the last item to do with the wings and I make them of one of the softwoods mentioned earlier, or, if they must be balsa, I'll core them with wire to assure they'll be strong enough to bear the loads imposed. The wire carrying the load and the balsa is for window dressing.

I would doubt that all of the alterations I have mentioned, properly done, would add a pound to the entire wing. Even if you are particularly heavy handed and added two pounds to the entire wing structure, you will likely find the





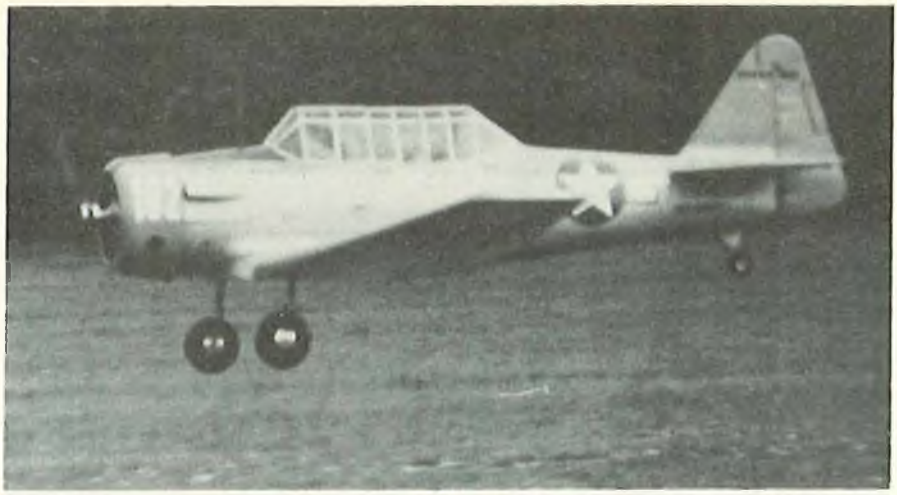
Manx 250 engine made by Bob Hoskins of Castalian Springs Tenn. Bob's engine is described in the text. Cam is belt driven.



Exhaust side of Hoskins engine. Two Perry carbs and straight stack exhausts shown. Engine was 2½ years in development and flies 30 pound Gere Sport easily.

weight will help rather than hinder flight of the model. The Quadra engine will fly most models of between 20 and 25 pounds with ease. The larger engines, correspond to heavier models, so the additional weight should cause no problems for you. Many lightly loaded Quadra powered models are so light that they are such floaters it is hard to get them to land easily and they are subject to being easily upset by even mild breezes, so the added weight could be a plus to a model designed to come out under 15 pounds.

The ingenuity of the model builder never ceases to surprise me and his willingness to take on a challenge is legendary. One such modeler has decided he wants to build engines. Bob Hoskins (Rt #1, Box 120, Castalian Springs, Tennessee 37031) sent me the engine pictured which is number 5 of a series. The engine is called the Manx 250 and is about 2.5 cubic inches and is an in-line two cylinder, four cycle engine. Bob has been in touch with me for some time and has flown one of his engines in a Gere Sport with considerable success. The engine is glow fueled and uses a couple of Perry carbs, one per cylinder. I have not yet run mine but have a tape recording from Bob of the engine being test run before shipping to me. It is very quiet and has a quite distinctive sound to it. At about 7½ pounds it's a bit heavier than its displacement warrants but it is certainly a show piece and will fly a model as Bob has demonstrated. One of the things which impressed me about the engine is the speed with



Wash Martin's second AT-6 from Nick Ziroli plan. First version had flaps and retracts, but was destroyed in collision with earth due to electronic problems. Flies very well.

which the rpm's build up when the throttle is applied. It's all but instant response to throttle.

The engine turns up 6200 with a 20/8 prop and 7000 with a 20/6. That's a lot of turns with that size prop and should produce plenty of thrust, so what seems like a little extra weight may not be so much after all. Bob say his 30 pound Gere Sport will climb at half throttle and is hard to stall unless you really get the nose up there.

Bob has been two and a half years developing the engine and plans to manufacture a limited number of them; last time we talked, the figure was 100. There are five in operation now, as mentioned above, and Bob's guess as to the selling price in a recent telephone conversation was approximately $500. Don't hold him or me to that figure though as that was a scientific wild-eyed guess made some weeks ago. If any of you are interested in further information, please write Bob at the address given and he'll provide you with the details of how you can own one of these little jewels.

Couple of nice things in recent mail deliveries. Nick Ziroli's AT-6 plan is now available from Nick (29 Edgar Dr., Smithtown, N.Y. 11787) and, as you can see from the picture of Wash Martin's version of the machine, it is impressive in the air. I can see the need for me to build one of these relatively modern airplanes (by my standards) and put a Kawasaki in it. The sound would be great! Nick also has a New Fokker Triplane on the market so if you have any inclination to emulate the Red Baron and go after Snoopy, here's a machine in which to do so! The At-6 and the Fokker join Nick's impressive line-up of P-40, F4U Corsair, and F8F Hellcat, already on the market for the WWII buff. A 20¢ stamp to Nick will get you a set of data sheets and prices on his wares.

A copy of the new Sig Clipped Wing Cub in Quarter Scale just arrived at my doorstep and it is a very nice kit, indeed. Hazel Sig and Maxey Hester had one ready to fly and one 'bare bones' at Las Vegas last October and they are nice. The one flown there flies quite aerobatically on a Fox .78 (to my surprise) and is quite an agile machine in the hands of the redoubtable Maxey. Construction, as visible in the uncovered example at Las Vegas, is very good and it was well-done by one of the Sig crew.

I plan to beef mine up a bit and add a Quadra up front (what else!) and will be reporting further to you on this as it progresses. With that much power available, it should be a real performer and then some. It's not necessary to add that sort of power to it, but that's the way I'm going with it. Should be fun to fly.

Nick Ziroli and Fokker tripe, latest addition to his line of WWII models and a departure from Nick's usual output. Prolific and wide ranging, that's Nick.

Hazel Sig and a mixed pair. Hazel's full sized Cub is well-known and the Quarter Scale of the Clipped Wing Cub flies aerobatically on Fox .78. Cowl and dummy engine included, kit is well-done and quite complete. Full span version is on the way and should be shipped about the time you read this.

Now, on a not too pleasent note, most of you who have written me know that I consider it to be a very real responsibility to respond to letters. With my move this year having created a delay, with a mail strike here of six weeks creating another one, and with the increase in volume

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GEMINI MTS

By Ed Slobod

Photos by Dick Harty

GEMINI MTS
Designed By: Ed Slobod
TYPE AIRCRAFT
Multi Task Sailplane
WINGSPAN
102 Inches
WING CHORD
Root 10"
Tip 7"
TOTAL WING AREA
930 Sq. In.
WING LOCATION
Shoulder
AIRFOIL
Semi-Symmetrical (MB 352515)
WING PLANFORM
Constant Chord Center
Double Taper Tips
DIHEDRAL EACH TIP
4° Center Panel
11° Tip Panel
O.A. FUSELAGE LENGTH
44¾ Inches
RADIO COMPARTMENT SIZE
(L) 8" x (W) 2⅛" x (H) 2"
STABILIZER SPAN
26½ Inches
STABILIZER CHORD (incl. elev.)
5" (Avg.)
STABILIZER AREA
133.5 Square Inches
STAB AIRFOIL SECTION
Symmetrical
STABILIZER LOCATION
Fin Mounted
VERTICAL FIN HEIGHT
9¼ Inches
VERTICAL FIN WIDTH (incl. rudder)
6½" Avg.
REC. ENGINE SIZE
NA
FUEL TANK SIZE
NA
LANDING GEAR
NA
REC. NO. OF CHANNELS
2
CONTROL FUNCTIONS
Rudder & Flying Stab
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa, Ply & Spruce
Wing ..... Balsa, Ply & Spruce
Empennage ..... Balsa, Ply & Spruce
Wt. Ready To Fly ..... 42-45 Oz.
Wing Loading ..... 6.50-6.96 Oz./Sq. Ft.

The Gemini MTS is the result of three years of design effort by the author.

This is the Gemini MTS. MTS stands for Multi Task Sailplane. It is my judgment that in the not too distant future, the currently popular duration-landing contests will give way to the multi task contest. Granted the MTS contest is more difficult to run, but it is a much better test of man and machine and its coming is inevitable. Okay, so what makes a MTS sailplane different? Since one of the tasks is speed it will have to be able to carry large amounts of ballast and it will need to be strong enough for 12 volt zoom launches. Does this mean a sacrifice of the qualities that make up a good thermal-landing sailplane? I don't think so. To be competitive in MTS events, the sailplane needs to be more efficient than the pure floater. Sinking speed can be equal to the floater but that is unlikely, and even if it turns out to be slightly greater the increase in range (penetration) more than makes up the difference.

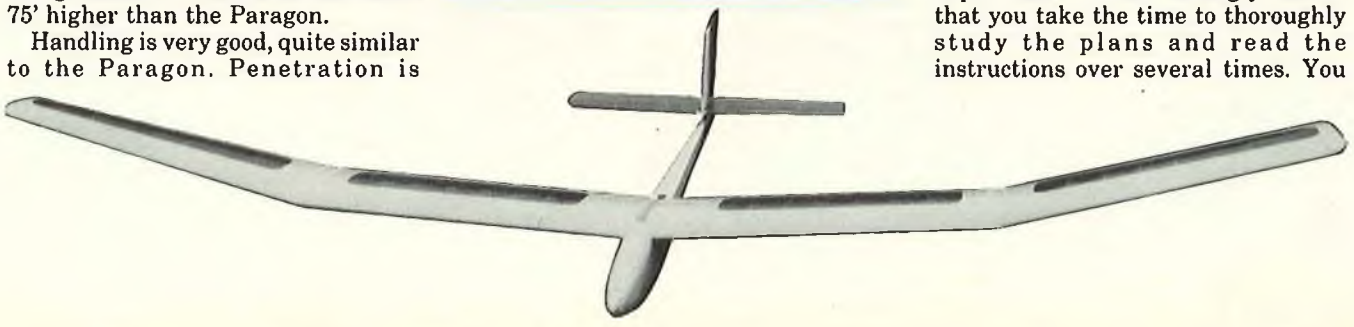
The Gemini MTS was designed to depart as little as possible from the characteristics of the Paragon and to have the additional capabilities required for MTS competition. At 43 oz. the Gemini MTS has a wing loading of 6.65 oz./sq. ft. which is about the same as the Paragon. In still air its sinking speed is only slightly greater. The Gemini MTS can be flown quite slowly and I would estimate that it is not more than 2 mph faster than the Paragon. The Gemini MTS is designed to be launched on a 12 volt winch and using a zoom release it launches about 75' higher than the Paragon.

Handling is very good, quite similar to the Paragon. Penetration is noticeably better empty and much better when both are ballasted. (To the same wing loading, of course.) Climb in thermals, a somewhat entangible quality, is excellent.

At the recent LSF contest, Alex Bauer flew my prototype Gemini MTS to second overall, and second in the speed task. He made one speed flight of 10.4 seconds which was the fastest scored during the contest. The model carried 3½ lbs. of ballast during the speed runs. Prior to the contest there was still some question in my mind about whether it was strong enough for a 12 volt zoom launch with 3½ lbs. of ballast and whether it would go fast enough if it survived the launch, but not now.

The Gemini MTS departs from conventional design in only one area; namely the use of a thick semi-symmetrical (bi-convex) airfoil section. This is not the place for a disertation on the relative merits of various airfoil sections. So we won't go into it. The Gemini MB253515 does the job and as an added free bonus we get a very strong torsion resisting wing. Also, if anyone cares, with this section the Gemini MTS does a very nice vertical "8" (inside loop followed by an outside loop).

The Gemini MTS can and has been built and flown by a number of modelers of just average ability in both areas but full realization of its capabilities will only be achieved by the more advanced builder/flier. Regardless of your building experience I would strongly advise that you take the time to thoroughly study the plans and read the instructions over several times. You



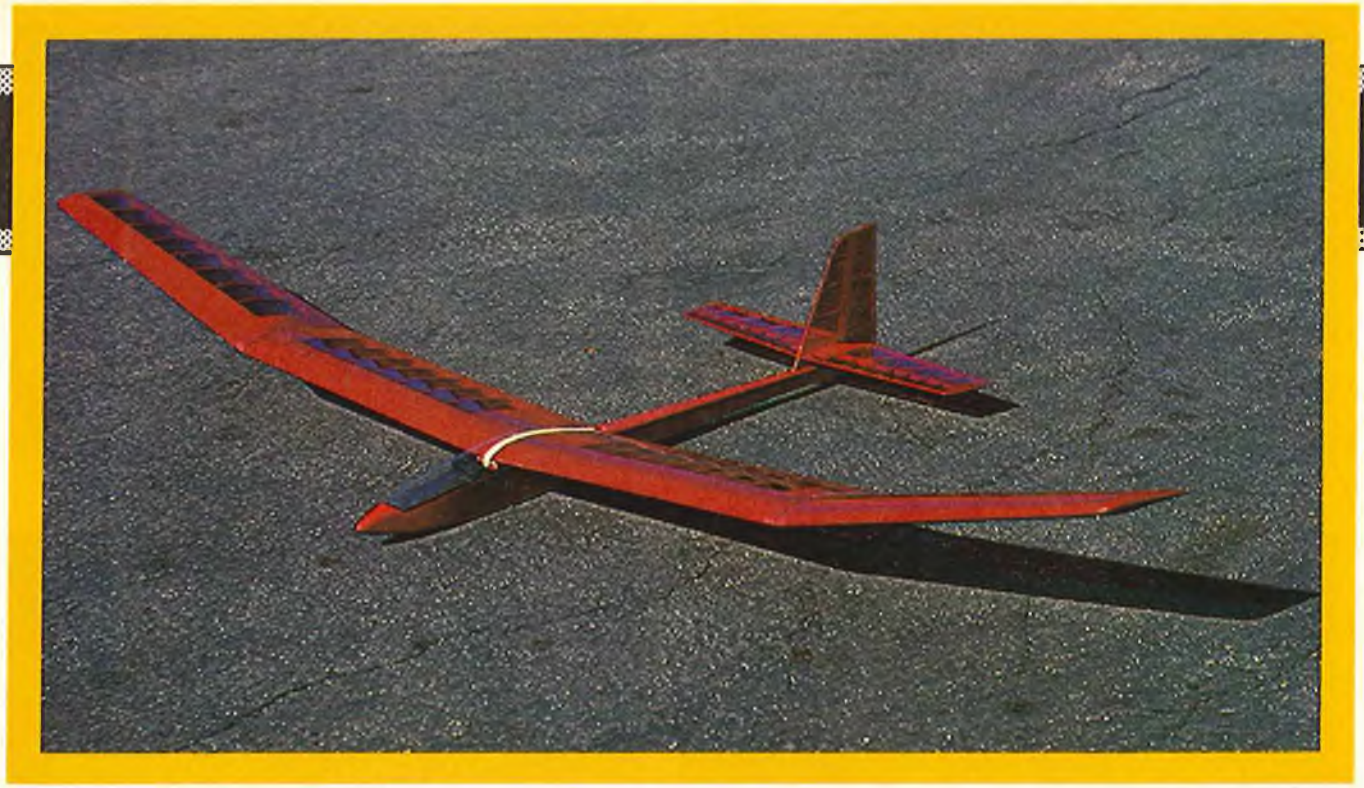


PHOTO BY JOHN GALLIVAN

may choose to do some things differently, and that's okay, but be sure you have all the assembly steps worked out in your mind, before you start.

CONSTRUCTION

The first step is to obtain all necessary materials and "kit" the wing. One way of transferring the wing ribs from the plans to the balsa is to obtain some 5 to 7 mil drafting mylar and to trace the rib outlines on to the transparent mylar. The mylar can then be cut to shape with scissors. It is thick enough to allow tracing along its edge so it is relatively simple to then trace all the patterns on to the balsa. The mylar can be used to make templates for the fuselage sides, formers, wing joiners, etc., and if you should ever want to make more parts the templates will always be available. All balsa parts should be made from medium firm stock with the exception of the wing tips which should be from very light balsa.

Wing Construction:

Step 1. Wing construction is started by positioning the bottom spars in place over the plans over 1/16" shims spaced 3 rib bays apart. Use a metal straightedge when you do this to be sure that the spar does not curve. Pin the 3/8" sq. support in place. Note the position of the tip panel support for built-in washout.

Step 2. Epoxy the center wing joiners together using the bottom ridge lines to line them up. Also check against the plans to make sure the dihedral angles are correct. Don't install at this time.

Step 3. Position the ribs as shown, **do not glue**, and check to see that all of the ribs touch the work surface. Temporarily pin to work surface and to the 3/8" support.

Step 4. Pin several 1/4" thick shims to the workboard over the leading edge of the plan for the main panel. For the tip panel use a 1/4" thick shim at the root and a 1/8" thick shim at the tip. Put the leading edge pieces in place and check for straightness and full contact with all of the ribs. If any of the ribs are too long or too short they can be adjusted to fit by removing some material from the spar cutout. Do this only if the rib is 1/32" too long or too short. If more than 1/32", you should make a new rib.

Step 5. When all the ribs are properly fitted, remove the two main inboard ribs and the root rib of the tip and put aside until later.

Step 6. Now, starting at one end and working towards the other, glue in a rib then a shear web, then the next rib, and so on. If, for some reason, the shear webs are not quite long enough and the ribs move more than 1/8" from the position on the plans, cut a new web to restore the next rib in sequence to the shown position and continue on. Do not glue in the rib at the outboard end of the main panel but leave it pinned in place.

Step 7. Now lay the 3/8" x 1/8" spruce top spar in position and check that the top surface of the spar is flush with the top surface of the ribs, and in contact with the shear webs. If there are some high webs they should be sanded down. If any of the shear webs are low they will have to be replaced, if possible, or thin shims will have to be glued in place to fill the gap. Good contact is important — don't depend on large blobs of glue to fill the gaps.

Step 8. Now cut the leading and top trailing edge pieces to length and glue in place. The rib at the outboard end should be angled for the tip panel dihedral. Do not glue the T.E. sheeting to the outboard rib.

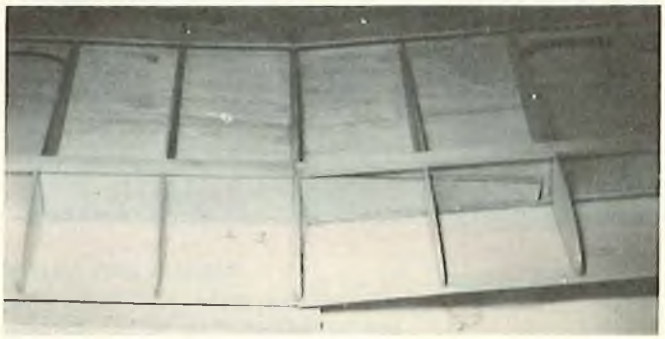
Step 9. Check for fit of the center joiner and if necessary trim to fit

ABOUT THE AUTHOR

Ed Slobod began modeling airplanes in 1936, and has been active in the hobby to the present time. He has designed, built and flown all kinds of free flight models with his primary interest being in hand launches, tow line gliders, and rubber powered models. He attended an aircraft mechanics trade school and acquired an Airplane and Engine Mechanics license. He graduated from the University of Southern California with a degree in Mechanical Engineering in 1954. Ed became interested in R/C sailplanes in the late 1960's and, except for some old timer modeling for several years, he has devoted most of his activities to R/C sailplanes. Ed was employed for 19 years as a wind tunnel model designer by the Douglas Aircraft Co., and is currently employed by Hughes Aircraft Company as a wind tunnel model designer. Ed went into business of kit manufacturing in the early 1970's. His company, the Pierce Aero Co., has produced the Pierce Arrow, the Pierce 970, the Paragon, and the Ridge Rat.

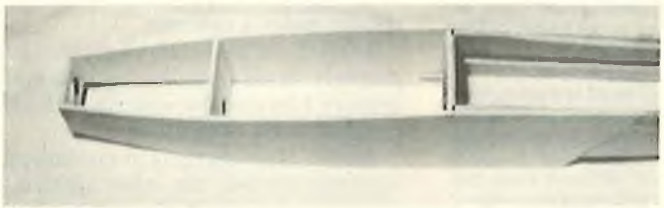
First step in wing construction. Read instructions and plans for the specific details.

Inboard wing panels in second stage of assembly.

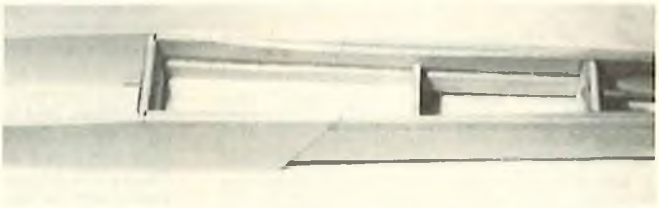


Inboard wing panels joined. Check plans for joiner plate details.

Tip panel in second stage of assembly. Panel must be properly shimmed and secured to building board prior to attaching top sheeting.



Forward fuselage area.



Top view of fuselage before wing saddle contour has been shaped in side panels to match contour of doubler.

Bottom view showing ballast floor installed.

Top view of fuselage showing wing mounting provisions.

between the spars. Epoxy in place, placing the bottom ridge over the centerline of the wing.

Step 10. Select a piece of straight grain medium 1/16" x 3" balsa and cut to length to be slightly longer than the main panel. Trim one edge with a straightedge and bevel to match the leading edge strip when flush with the rib contour. The opposite edge will wind up on the top spar about 1/8" forward of the aft edge of the spar. Glue the sheeting in place. Attach to the leading edge piece first then roll the sheeting towards the spar. Be sure that the sheeting is glued to all the ribs and that there are no voids. Next, add the capstrips and the sheeting at the root. Partially sheet the section at the outboard end but leave enough open area to enable you to install the 1/8" balsa sides in the last bay for the tip panel tongue.

Step 11. The tip panel is constructed in the same manner except that the sheeting will have to be trimmed to match the taper. When gluing the ply joiner to the spars, be sure it is centered chordwise. The root rib of the tip panel is cut apart and trimmed to go on both sides of the joiner but is not glued in place until the tip panel is plugged into the main panel.

Step 12. Allow sufficient time for the glue to dry thoroughly after which time the tip panel be removed from the workboard and propped up in position against the main panel with the joiner inserted between the main panel spars. Cut the 1/8" balsa box sides and glue in on both sides of the tip panel joiner. Be sure to withdraw the joiner before the glue has dried. The outboard rib of the main panel should now be cut apart, trimmed and glued. Now finish the top sheeting.

Step 13. The bottom trailing edge strip, sheeting and capstrips are installed with the individual panels pinned inverted to the plans. Shim up

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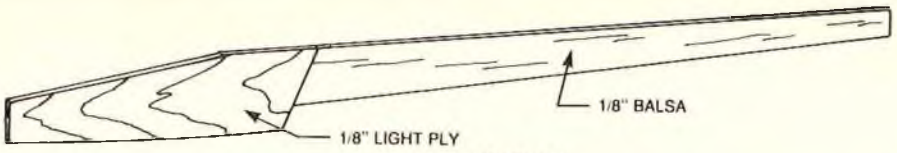


FIGURE 1

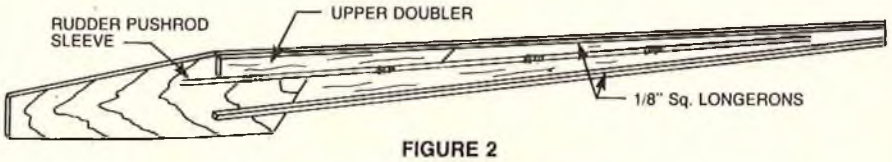


FIGURE 2

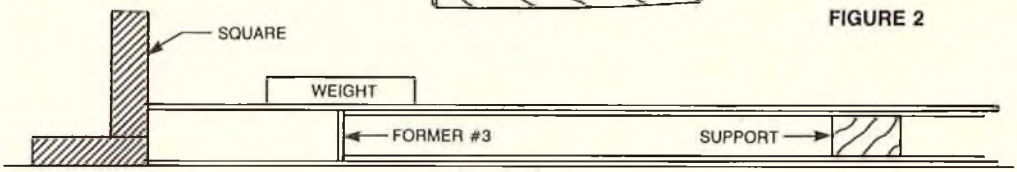


FIGURE 3

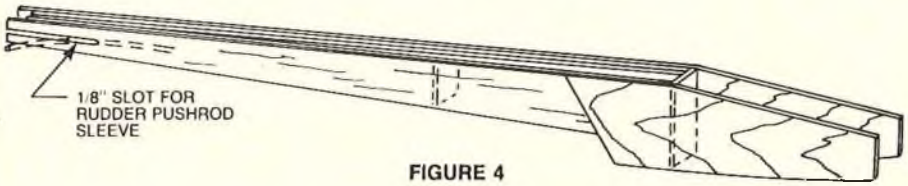


FIGURE 4

FIGURE 5

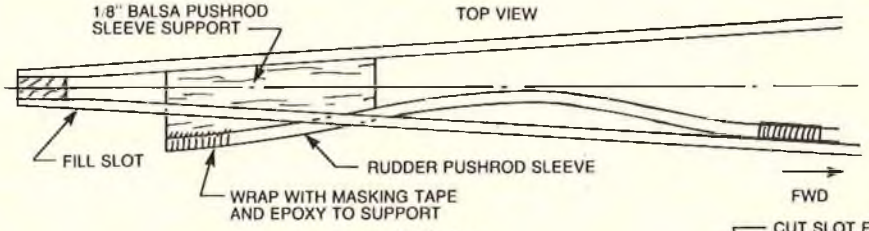


FIGURE 6

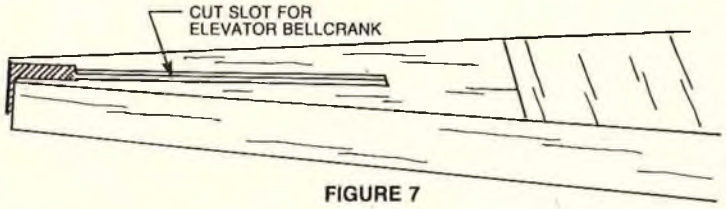


FIGURE 7

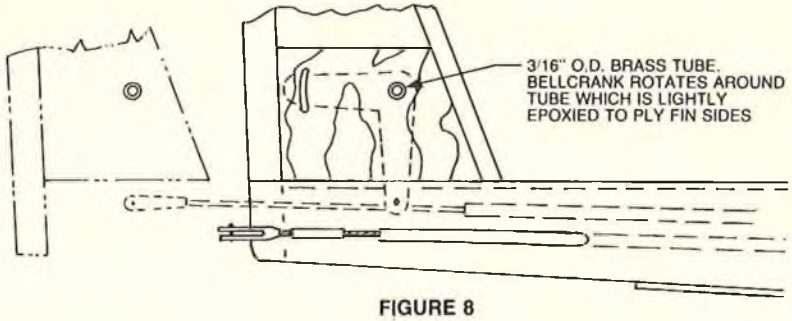


FIGURE 8

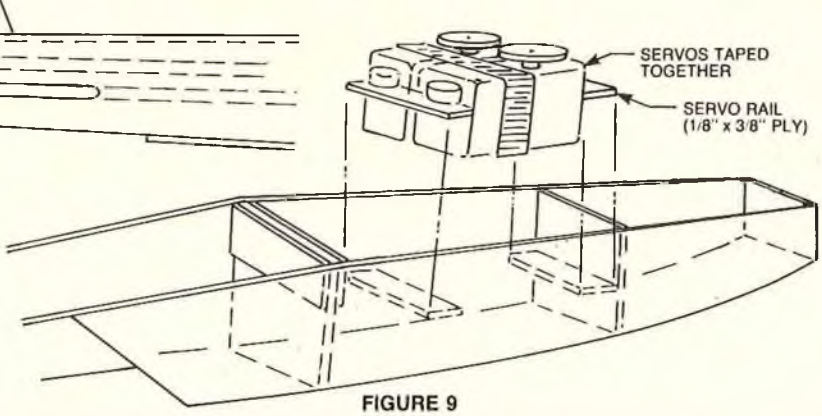
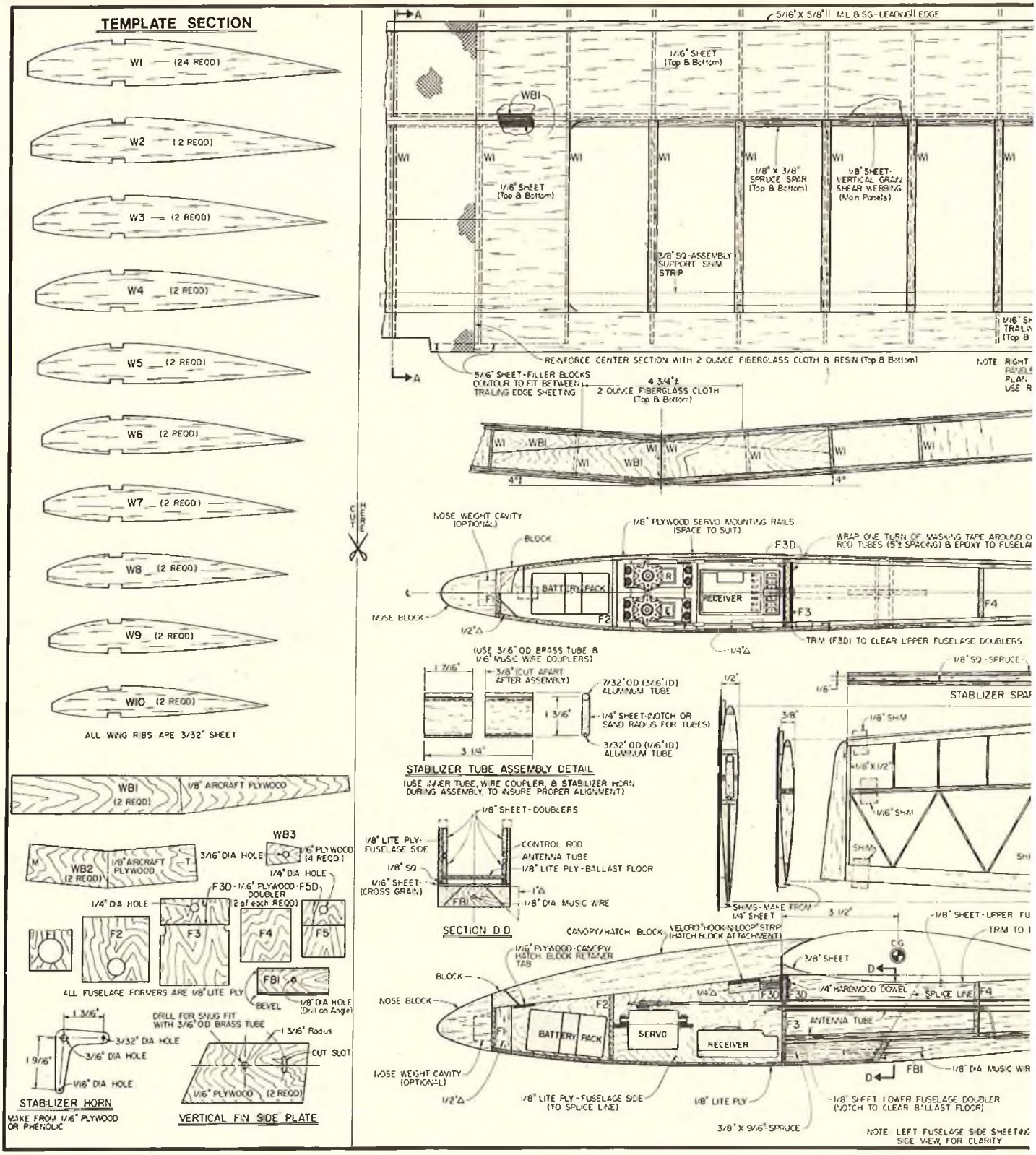


FIGURE 9



as required and be sure there is no twist in the main panel. The tip panel will have some wash out twist built in and it should be pinned down to retain this twist. Be sure to epoxy the main panel joiner to the opposite panel spars before completing the sheeting.

Step 14. Make up the trailing edge insert blocks and install as shown at the wing root and the outboard dihedral joints.

Step 15. Trim ends of tip panels and add tip blocks.

Step 16. Shape leading edge, wing tips and trailing edge, carefully. Sand entire wing smooth. Add fiberglass to top and bottom of center section and sand smooth when dry.

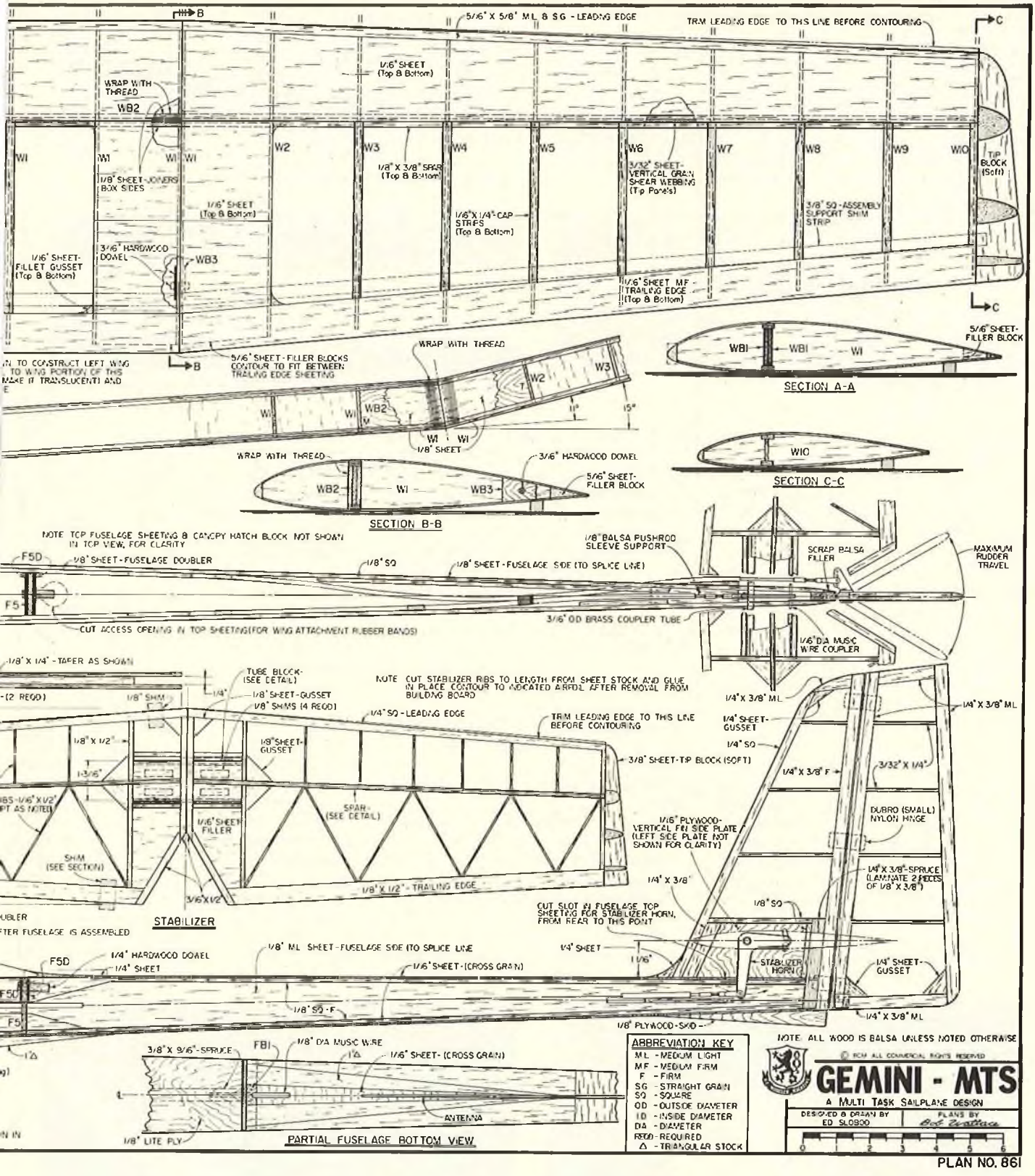
Fuselage Construction:

Step 1. Join fuselage side pieces. Use 5 minute epoxy (see Fig. 1).

Step 2. Glue 1/8" sq. balsa longerons in place (see Fig. 2).

Step 3. Add 1/8" balsa upper doubler (see Fig. 2).

Step 4. Wrap pushrod sleeve with one wrap of masking tape at approximately 4" spacings and epoxy sleeve to fuselage. Be sure to make a left and right hand side (see Fig. 2).



PLAN NO. 861

Step 5. Pin fuselage side to workboard over plans and glue in Former #3. Use square to be sure it is perpendicular to fuselage side.

Step 6. Glue other side to Former #3 as shown in Fig. 3. Use square all around.

Step 7. Cut 1/8" slot for rudder pushrod sleeve (see Fig. 4).

Step 8. Sand inside of fuselage sides at rear to be parallel to 1/4" x 3/8" tail post (see Fig. 5).

Step 9. Pull sides together with a scrap piece of 1/4" x 3/8" temporarily pinned in place. Be sure sides have same amount of bow.

Step 10. Glue in Former #5.

Step 11. Glue in Former #1.

Step 12. Glue in Former #2.

Step 13. Glue in ballast tray.

Step 14. Glue in lower doubler.

Step 15. Glue in Former #4.

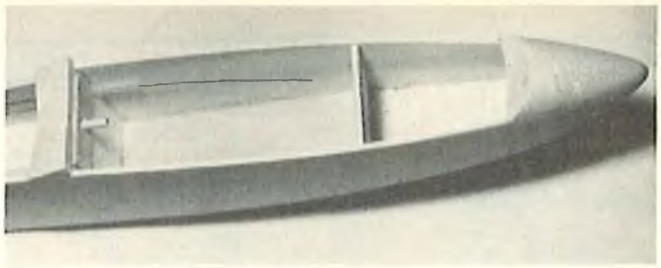
Step 16. Drill hole in tow block for snug fit with 1/8" wire.

Step 17. Epoxy tow block to Former #1 and ballast tray.

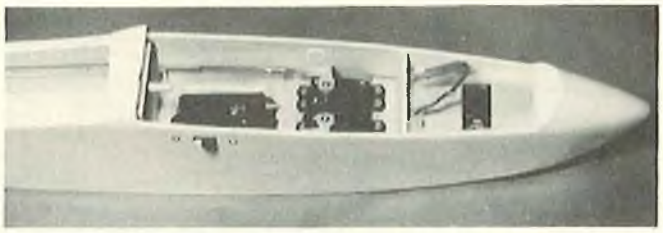
Step 18. Drill 1/8" ply for tow hook clearance, fit and epoxy to fuselage side edges and rear of tow block.

Step 19. Fit and glue in 1/8" balsa

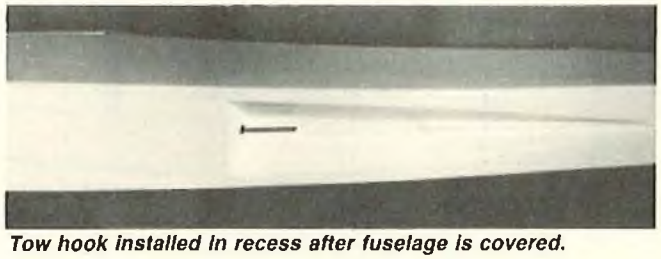
Blocks have been attached to form recess for tow hook.



Nose section ready for radio installation.



Typical radio installation.



Tow hook installed in recess after fuselage is covered.

rudder pushrod sleeve support (see Fig. 6).

Step 20. Cover fuselage, top and bottom, with 1/16" sheet balsa. Leave bottom at rear open until after elevator pushrod hook-up has been made.

Step 21. Cut slot in top sheeting for elevator bellcrank (see Fig. 7).

Step 22. Hook up elevator clevis to bellcrank — snap clevis closed. Move rudder (fin) forward and glue to fuselage. Especially rudder post to fuselage sides. Finish covering bottom of fuselage (see Fig. 8).

Step 23. Before covering forward bottom of fuselage with 1/8" ply, the servo rails should be installed. To do this, first tape the servos together with a 1/16" to 1/8" spacer between them. The rails are made from 1/8" aircraft ply and should be slightly longer in length than the width of the fuselage where they will be installed. Mark the mounting hole locations on the rails while holding in position under the servos. Drill for the mounting screws. Mount servos to the rails. Now prop fuselage up level on workbench and ballast to prevent movement. Trim ends of servo rails carefully so that the servo and rails can be just slid into place. Shim under servos so that the pushrods and servo wheels are on same level. Tack epoxy the servo rails. When dry remove the servos and epoxy all around rails where they join fuselage sides (see Fig. 9).

Step 24. Epoxy 1/8" ply to forward bottom.

Step 25. Add triangle stock to fuselage bottom.

Step 26. Add nose block and triangle stock aft of Former #1.

Step 27. Add small block aft of nose block.

Step 28. When dry shape nose block area.

Step 29. Contour triangle stock on fuselage bottom.

Step 30. Add 3/16" dowels and 1/16" ply reinforcement plates to Formers #3 and #5 if you haven't already done so.

Step 31. Shape a block of balsa to fit open forward fuselage and over front of wing. Tack glue to fuselage. When dry, contour as shown on plans.

Step 32. Make cutout in fuselage sides to match bottom contour of wing.

Step 33. After fuselage is assembled, sand smooth, round corners if you wish. Cover entire fuselage with 2 oz. fiberglass. If any weave shows after sanding out, apply a second coat of resin. Squeegee off or blot off excess resin. When dry sand smooth. Apply primer and paint as preferred.

Horizontal Stabilizer Construction

Step 1. Select a piece of firm 1/4" balsa and cut to 3¼" long by 1-3/16" wide. Cut the "V" grooves for the 7/32" O.D. tube and the 3/32" O.D. tube carefully so that you do not miss the 1-3/16" distance between centerlines. You can check this as you go by holding the tubes in place in the grooves. Slip the 3/16" I.D. brass tube and the 1/16" wire into the tubes and check at both ends, by slipping the pre-drilled elevator bellcrank over the inner tube and wire. If you prefer you can make rounded tube recesses by

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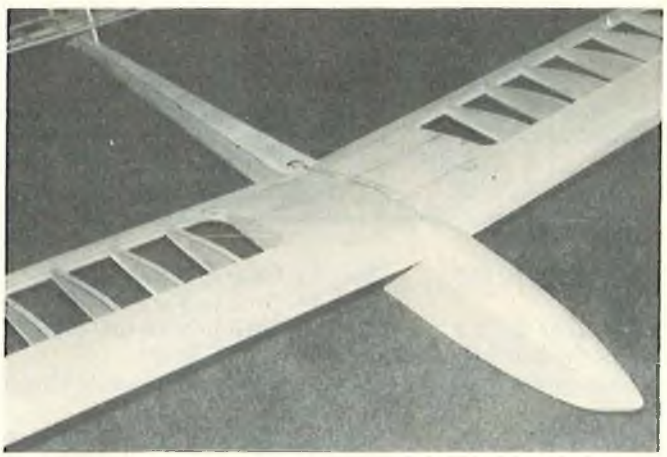
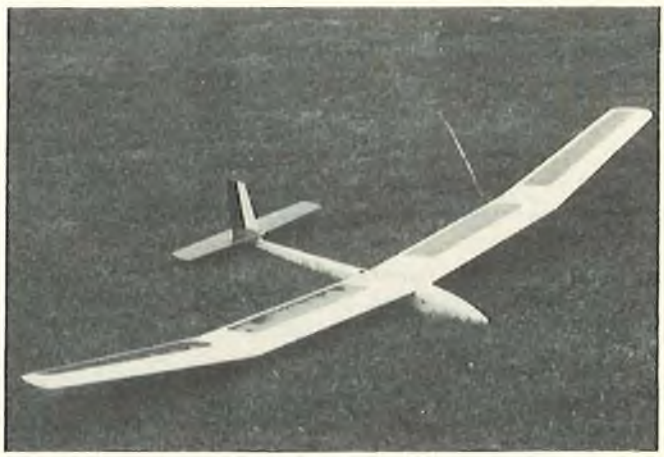


Gemini ready for covering and finishing.



And . . . ready to take to the skies.

RCM PRODUCT REVIEW

Top Flite Models
J-3 CUB

SPECIFICATIONS

Name	J-3 CUB
Aircraft Type	Stand-Off Scale
Manufactured By	Top Flite Models, Inc. 1901 N. Narragansett Ave. Chicago, Illinois 60639
Mfg. Suggested Retail Price	$109.95
Available From	Both Mfg. & Retail
Wingspan	77½ Inches
Wing Chord	10 Inches
Total Wing Area	795 Square Inches
Fuselage Length	49⅛ Inches
Stabilizer Span	21.5 Inches
Total Stab Area	139 Square Inches
Mfg. Rec. Engine Range	.35-.50
Recommended Fuel Tank Size	6-8 Oz.
Recommended No. of Channels	4
Rec. Control Functions	Rud., Elev., Throt., Ail.
Basic Materials Used In Construction:	
Fuselage	Balsa & Ply
Wing	Balsa & Ply
Tail Surfaces	Balsa
Building Instructions on Plan Sheets	Yes
Instruction Manual	Yes (14 pages)
Construction Photos	Yes

RCM PROTOTYPE

Radio Used	Futaba FP4FN
Engine Make & Displacement	O.S. Max .40
Tank Size Used	6 Oz.
Weight, Ready to Fly	79 Oz.
Wing Loading	14.3 Oz./Sq. Ft. (dry)

SUMMARY

WE LIKED THE:
See conclusion in text.

WE DIDN'T LIKE THE:
See conclusion in text.

One of the most popular aircraft of all time, was the Piper J-3 Cub. This aircraft was used for everything from pilot training to back country supply. This aircraft, that has flown successfully in every environment from arctic to desert, and tropical to down-town, is a natural for a large scale model.

The Top Flite kit comes well-packed in a red box that measures 42"x 10½" x 4⅞", and includes a very nice picture of the completed J-3 on the front. The box is so well-packed, be prepared to start your building right away because you will find out, as we did, it takes an experienced packaging engineer to get it all back correctly in order to get the top back on. All major parts have a printed number and are easy to identify. The complete hardware package was a welcome surprise, and included, nuts, bolts, engine mount, horns, bellcranks, pushrods, and more. Also included is a very nice decal set, high quality die-cut windows and windshield, formed hardwood wing struts, and a formed cowl.

Construction:

Three well-drawn plan sheets, 35" x 44" and a fourteen page instruction book, that is full of informative drawings, function as an easy to follow guide to construction. One major error we noted in the instructions, was a lack of information about installing the 1/4" x 20 blind nuts for wing mounting. These must be installed before sheeting the wing root, but the instructions do not mention this until page eleven in the book. Step thirty on page five says, sheet the wing root with the 1/16" balsa sheet provided. If you follow the instructions in this area, you will get a big surprise on page eleven.

Once you decide to build the clipped wing (59½" span, 595" area), or the regular wing (77⅛" span, 795" area), begin building the wing using balsa ribs and half ribs, two main spars, two sub spars and leading and trailing edge sheeting. The ailerons are constructed with the wing and then cut away which ensures a good fit. Both wing panels are built directly over the plans. The only problems we had during construction were caused by the error in the instructions (noted above), a missing wing spar, die-cutting that required cutting and sanding each part by hand, and a shortage of balsa cap strip material. The wings build up to be strong and very light. We like the idea of removable wing panels, which allow a large model to be transported in a small car.

The fuselage builds over the plans using 1/4" x 1/4" balsa for the framework, and 1/8" balsa sheeting, balsa filler blocks, ply bulkheads and balsa formers. The upper cabin structure is die-cut ply to simplify construction. The same problem was encountered here with die-cutting as when the wings were built, but all of the required wood was supplied in generous quantities. During construction, Goldberg Super Jet was used for all basic building and Devcon 5-Minute epoxy for the firewall, landing gear blocks, and wing attaching points.

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PIT STOP

Gene Husting

This Associated Team won the 4th Annual 24 hours of Miami Race, making it 3 wins in a row. On the left, Gene Husting and Roger Curtis, the alternate drivers, then pitman Bill Newlin who did all the refueling and car chasing. Then drivers and mechanics Curtis Husting, Bill Jianas and Rick Davis.

The cars are placed on the starting line with the motors off. At the start of the race, the cars then must be taken to the pits to be started and placed on the track.

Even though I've been there, I still find it hard to believe how many racers are willing to accept the challenge of a 24 hour race! This year, 34 drivers and pitmen on six teams met the challenge, and five teams were able to finish the 24 hours, which to me, is still hard to believe! I've seen scores of drivers leave the driver's stands on races lasting only half an hour, and they've looked quite exhausted from the incredible amount of concentration required to compete. The last thing on their minds would be a 24 hour attempt.

But here we were, ready to try the impossible again. Listed below are the teams and drivers entered. Car numbers were assigned from previous performances here, with the exceptions of teams five and six, which were new teams.

Team #1 was the Associated team that has won this event the last two years, with the exception of two alternate drivers Roger Curtis and Gene Husting. Rick Davis, Curtis Husting and Bill Jianas felt they could drive the race alone, but the rules require at least four and no more than six drivers. So they were more or less forced to accept a couple of "over the hill" drivers as teammates. The car they used was the Associated RC300 with ball differential. Rick Davis built half the car in Detroit and then sent it to Curtis and Bill to finish in California. The engine was the new K & B 3.5 prepared by motor wizard Rich Lee. Radio was the new Airtronics. The car had been run one afternoon at Pomona for about 1/2 hour to adjust carburetors before Miami.

Team #2, the Delta Team from Iowa, was full of surprises. This team led the first half of the race last year and finally finished a close 2nd. We were hearing all kinds of rumors before the race. Generally rumors are just that — rumors. As most of you know, Delta has been testing their new prototype fully independent suspension car. You have no idea what an undertaking this is until you try it. We were told they were in Miami two weeks testing the car and that they were planning on racing it in the 24 hours. We found this a little hard to believe. The probability of taking a brand new designed car and winning a 24 hour race would be about a 1,000,000 to 1 longshot. On the other hand, what if they should win. Wouldn't that be an accomplishment!

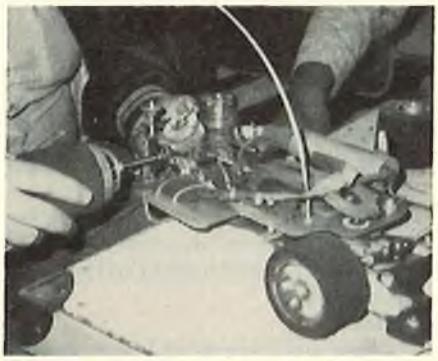
Associated car #5 finished 3rd. Ralph Burch is thinking #1, Ralphie Burch, Jr., motor wizard, Rich Lee, Joe Sullivan; all drivers, then pitman Carl Petrie, who is now a wiz at changing servos, then Chuck Phelps and Dana Smeltzer.

Team Delta bucked the 1,000,000 to 1 odds and challenged the 24 hours with their prototype independent suspension car. They did manage to finish in 4th place, which is incredible.

Believe it or not, there's a car on the track in the center of the photo near the boards. If you can't see it, imagine how the drivers feel driving at night.

2nd place finishers were the Future Homes Team from Ft. Myers, Florida with their Delta Super J car. Tassillo McNeeley, Hepner, Ballentine and Anderson did a super job.

One of the most consistently fast racers in the world, Rick Davis prepares for a pit stop.



Rick changes the rear tires by changing the whole differential as a unit. It's faster this way.

Car #1 Team Associated #1 Santa Ana, Calif.	Car #2 Team Delta Lorimor, Iowa	Car#3 Team Future Homes Ft. Myers, Florida
Roger Curtis	Butch Barry	Curtis Anderson
Rick Davis	Mike Barry	Dick Ballentine
Curtis Husting	Art Carbonell	Ray Hepner
Gene Husting	Javier Loras	Doug McNeely
Bill Jianas	Chuck Moon	Joe Tassillo
Bill Newlin	Rafael Rio	Joe Tassillo III

Car #4 Team Puerto Rico Hato Rey, P.R.	Car #5 Team Associated #2 Santa Ana, Calif.	Car #6 Team P.B. St. Petersburg, Fla.
John Basaraba	Ralph Burch, Jr.	Trigg Fortner
Paul Condello	Rich Lee	Dave Hadsock
Jose Pereles	Chuck Phelps	Rocky Hagan
Raul Rivers	Dana Smeltzer	Warren Jamison
Papo Torres	Joe Sullivan	John Riley
Octavio Valdes	Carl Petrie	Gary Weideman

Time	Laps Turned Per Hour					
Start 12:01:40	1	2	3	4	5	6
1:01:47	170	175	166	135	133	120
2:03:35	177	151	165	124	163	120
2:59:32	160	130	146	111	156	98
3:57:34	164	142	148	113	155	78
4:56:34	171	133	146	128	151	71
6:01:41	171	171	169	125	122	42
6:58:30	163	131	148	96	155	107
7:59:44	175	115	120	101	110	79
8:56:30	164	122	138	87	138	51
9:54:44	164	112	141	116	123	44
10:56:36	163	129	168	79	149	12
12:01:20	173	140	169	144	116	58
12:58:56	168	146	135	111	140	0
2:02:32	181	50	170	116	183	0
3:02:44	172	107	142	119	160	0
4:02:25	161	131	104	115	89	0
5:05:10	183	137	139	99	142	0
5:59:21	149	63	148	97	143	0
7:02:08	173	158	166	38	165	0
7:56:09	159	129	144	91	77	0
9:00:06	180	95	169	99	157	0
10:03:20	178	145	157	93	127	0
10:59:09	165	145	143	116	131	0
Finish 12:01:40	176	150	161	151	106	0
Total Laps	**4060**	**3107**	**3602**	**2604**	**3291**	**880**

Apparently two of their drivers from last year's team, from Texas, we were told, decided it was also a longshot and decided not to participate this year.

Team #3, from Ft. Myers, Florida, were a team of seasoned veterans. They were 3rd last year, and figured this year they should have the experience to put their Delta Super J in 1st place. They just might do it.

Team #4, from Puerto Rico, were a bunch of super nice people. But I don't think they quite understood what it would take to win a 24 hour race. But they sure had fun trying with their Delta Super J.

Team #5 was another Associated Team with a car similar to the #1 team. This team had to be one of the co-favorites. This team, with Rich Lee, Chuck Phelps, Jim Nelson and Gene Husting had just won two 6 hour Enduro's in Southern California, in preparing for this race. The race at Pomona had eleven teams and the race at Ventura had thirteen teams so you know they earned their victories. And with the addition of Ralph Burch, Jr. and Joe Sullivan from Texas, they had a super driver's team.

Team #6 from St. Petersburg, Florida, was a bit of an unknown, in that this was the first time a P.B. car was entered in the 24 hours. It should be interesting.

Friday was a practice day used not only for testing and setting engines, but for all the drivers becoming familiar with their team's car and for getting used to unfamiliar transmitters, etc., and sure enough — some of those rumors were true! There was Team Delta running their prototype IS car! I asked Bill Campbell

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THE FINISHING TOUCH — PAINT

Part II

By Richard Buescher, D.D.S.

Surface Preparation & Spray Equipment:

After Part One's brief overview of the various color topcoats, I will try this time to highlight the basics of surface preparation, and also discuss spray equipment. I am sure other modelers will have alternate techniques, but the information here will allow you to **maximize the advantages of the newer products** we discussed in Part I, and allow you to produce the finest possible finish. Remember, you alone decide what your finishing standards are, versus the time / effort / expense that you are willing to invest. Any compromise in surface preparation will be evident in the final finish of your model.

Sanding:

Use only high quality aluminum oxide (Al0) sandpaper (3M or Bear). Cheap sandpaper, like cheap masking tape, is not a real bargain. Another excellent 3M sandpaper is called Fre-Cut, but I have only found it in #180 and #320 grades. The most commonly available 3M grades are #60, #100, #150 and #220, however, I personally like grades #80, #120, and #180 in A10 papers.

Most sanding should be done with **sanding blocks.** The 3M rubber block is the standard. Modify it by adding a 1/4" thick **dense latex** foam carpet pad, using rubber contact cement as your adhesive. Also make your own assorted wood blocks (flat), attaching the sandpaper by stapling it to the sides. Modify some of these with the 1/4" foam pad also. The commercially available aluminum T-Bars are handy — attach your sandpaper with contact cememt. Among my own wood blocks, I have a 22" x 6" set-up with #50 grade, and a couple of 11" x 1½" covered with #80 and #120 grades. Another favorite of mine, especially for tail parts, is a 1¼" x 4¼" decoupage sanding block by Royal Coat. It has a nice 1/4" felt pad on it.

Our objectives in sanding are **two; level** the surface as well as **smooth** it. Especially on flat surfaces, level cannot be achieved unless a sanding block is used. Most modelers are too "timid" with sandpaper — they are afraid to use the coarse grades that can get the job done properly and quickly. Instead they tend to start out with grades that are too fine such as #220, and end up smoothing existing irregularities into waves and dips instead of obtaining the needed leveling of the surface first, smoothing somewhat after that with #100 or #150. I do not waste time using a grade finer than #150 where surfacing resin is to be the finish base course, as the resin only raises the grain again anyway.

Surfacing Resin (Polyester):

The balance of this article is based upon using K & B or Sig brands of polyester resin as the key surface preparation of the balsa wood before proceeding to the primers and color topcoats. Tops on my list, in order of preparation are: K & B resin + Softglas + DuPont 100S auto primer-surfacer + color top coat.

(Editor note: resin is very odorous. Ventilate with a fan if you want to save your marriage. Also it attacks foam, and won't cure over epoxy glue or cyanoacrylates that are on the surface. It will cure over 5 minute epoxy, and sometimes over Sig Epoxylite if it is well cured. If you forget these curing rules and find yourself with a tacky coat, a second coat over that will often cause the first coat to cure). When using resin, you can decrease the curing time by adding more catalyst. Mix in 2 oz. increments so you do not waste material by having it cure (jelling is the first sign that curing is taking place) too soon. Apply with a stiff brush, not a soft one.

(Again your editor speaks: the catalyst may be the single most dangerous substance in your shop. Treat it that way. It is an oxidizer, and if it comes in contact with the lens of your eye, can rapidly damage it permanently. "Throw-away" brushes are the most common for application, but if you want to use the brush over, epoxy thinner will wash it out as long as the resin is not too far into the jelly stage).

When sanding the cured resin (anywhere from 1/2 hour to 2 hours to cure, it then is a very hard surface), vigorously attack it with #80 grit. I even go after it with #60 grit if the grain has raised unevenly in some areas. If you start with anything finer than #80, you are wasting your time, and are developing bursitis and tendonitis. More importantly, you are not leveling the surface, but merely **polishing the irregularities.** On your final coat (two are usually sufficient) after leveling with #80, smooth out with #120. Major surface irregularities must be filled with resin that is thickened with microballoons.

Glue joints, such as wing sheeting, rudder parts, wing tips, etc., may be prevented from eventually cracking apart by including **fiberglass cloth** (usually 1/2 or 3/4 oz. grade) in the application of the first coat of resin. Glass cloth adds virtually no weight, but adds enormously to the strength of the surface. In planes requiring an even thicker cloth reinforcing of the wing center section, apply the cloth with your resin rather than the epoxy called for in the kit plans. Any fillets should be applied by making a paste mixture of resin & microballoons, and can be shaped with a finger wetted in water. Forget any other fillet combinations, especially those containing epoxy. They are too hard to sand, and resin won't cure over them if you need to recoat any fillet to blend in. Important: it is imperative that the wood surface adjacent to the fillets is equally as hard as the fillet material, otherwise ditching and gouging will occur when sanding the fillets. An easy way to sand fillets is to roll #80 grit around dowels of various diameters (1/4", 3/8", 1/2", 5/8") which are cut to 2¼" long. Now clamp the "tails" of the sandpaper in a "Boston #3 paper clamp," to which sandpaper has been contact cemented to the inside of the jaws to give the clamp extra gripping power on the sandpaper tails of the dowels. After the fillets are sanded, brush on a final coat of resin, and blend in to the level surfaces.

Primer:

If you only have what I later in this article classify as a "small" orifice spray gun, stay with K & B primer for this next step. But if you have access to a larger gun, I recommend DuPont's Softglas as the next coat. It is very thick, and hard to stir. You can figure on 10-15 minutes of stirring time using a 1" wide paddle. Like resin, it attacks foam, so be careful in those retract wells, or servo openings. SG

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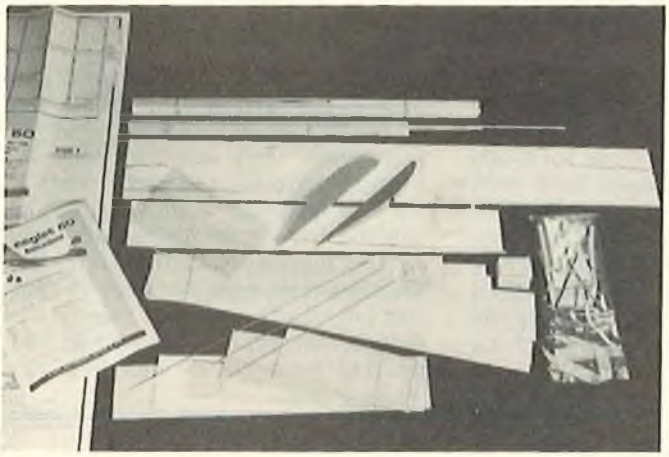
RCM PRODUCT REVIEW

Carl Goldberg's EAGLET 50



SPECIFICATIONS

Name	EAGLET 50
Aircraft Type	Trainer
Manufactured By	Carl Goldberg Models, Inc. 4734 W. Chicago Ave. Chicago, Illinois 60651
Mfg. Suggested Retail Price	$34.95
Available From	Both Mfg. & Retail
Wingspan	50 Inches
Wing Chord	9 Inches
Total Wing Area	450 Square Inches
Fuselage Length	35¼ Inches
Stabilizer Span	18.25 Inches
Total Stab Area	105 Square Inches
Mfg. Rec. Engine Range	.10-.20
Recommended Fuel Tank Size	4 Oz.
Recommended No. of Channels	2-4
Rec. Control Functions	Rud., Elev., Throt.
Basic Materials Used In Construction:	
Fuselage	Ply
Wing	Balsa, Ply, Basswood, Plastic
Tail Surfaces	Balsa
Building Instructions on Plan Sheets	Yes
Instruction Manual	Yes (36 pages)
Construction Photos	Yes

RCM PROTOTYPE

Radio Used	Futaba FP4FN
Engine Make & Displacement	O.S. Max .20 RC
Tank Size Used	Sullivan 4 Oz.
Weight, Ready to Fly	44 Oz. (dry)
Wing Loading	14 Oz./Sq. Ft.

SUMMARY

WE LIKED THE:

Plan, instructions, formed plastic wing tips, and flight performance.

WE DIDN'T LIKE THE:

None noted.

The Eaglet, designed by Carl Goldberg to include all of the things that make a basic trainer easy to build and fly, comes packed in a light blue box measuring 37½" x 6¼" x 2½". The Eaglet was very well-packed with cardboard spacers between the hardware and wood parts. The hardware package was complete to include formed wire gear, bolts and blind nuts, pushrod material, links, horns and more. To give this kit a fair evaluation required the help of a beginning builder and flier.

Construction:

One well-drawn plan sheet 35" x 44" and a thirty-six page instruction manual, which includes about 120 construction photos and a like number of drawings, was packed so you will see them first. The instruction book provides the beginner with a large amount of basic information about tools, adhesives, and construction techniques. The quality of the plans and instructions was matched by the good die-cutting and the way the parts matched the plans.

The fuselage is constructed directly over the plans by installing all the bulkheads and the fuselage top, and bottom and side, then using elastic bands to hold everything together while the whole assembly is checked for correct alignment. Goldberg Super Jet was the quickest and easiest way to glue the fuselage assembly together, while holding everything in alignment. The complete fuselage is constructed of light ply with a key lock feature that ensures a light, strong, and straight fuselage.

The wing assembly goes together as fast and easy as the fuselage. The wing is built over the plans using balsa ribs, bass wood spars, hardwood dowel leading edges, and balsa trailing edge stock. We used Goldberg Super Jet for all wood joints including shear webs and dihedral braces. The method of construction presented in the instruction book was easy to follow. The wing builds into a very light but strong assembly.

Both vertical and horizontal stabs are built over the plan using 3/16" balsa, 1/8" x 3/16" balsa, die-cut balsa tips, and a balsa center section. We used Goldberg Super Jet to get the job done fast. The rudder and elevator are preshaped and required only light sanding before covering.

Covering:

Following a complete sanding, all sub-assemblies were given one coat of Coverite-Balsa Rite and then covered with Top Flite Super MonoKote. To cover the Eaglet, it will take about one roll of covering material and possibly give you a chance to clean out your scrap box. We covered ours with dark blue, red, maroon, yellow, and white. We then used the decals supplied to finish the project.

Engine:

An O.S. Max .20 R/C engine was installed on the hardwood rails using the bolts and nuts supplied. A

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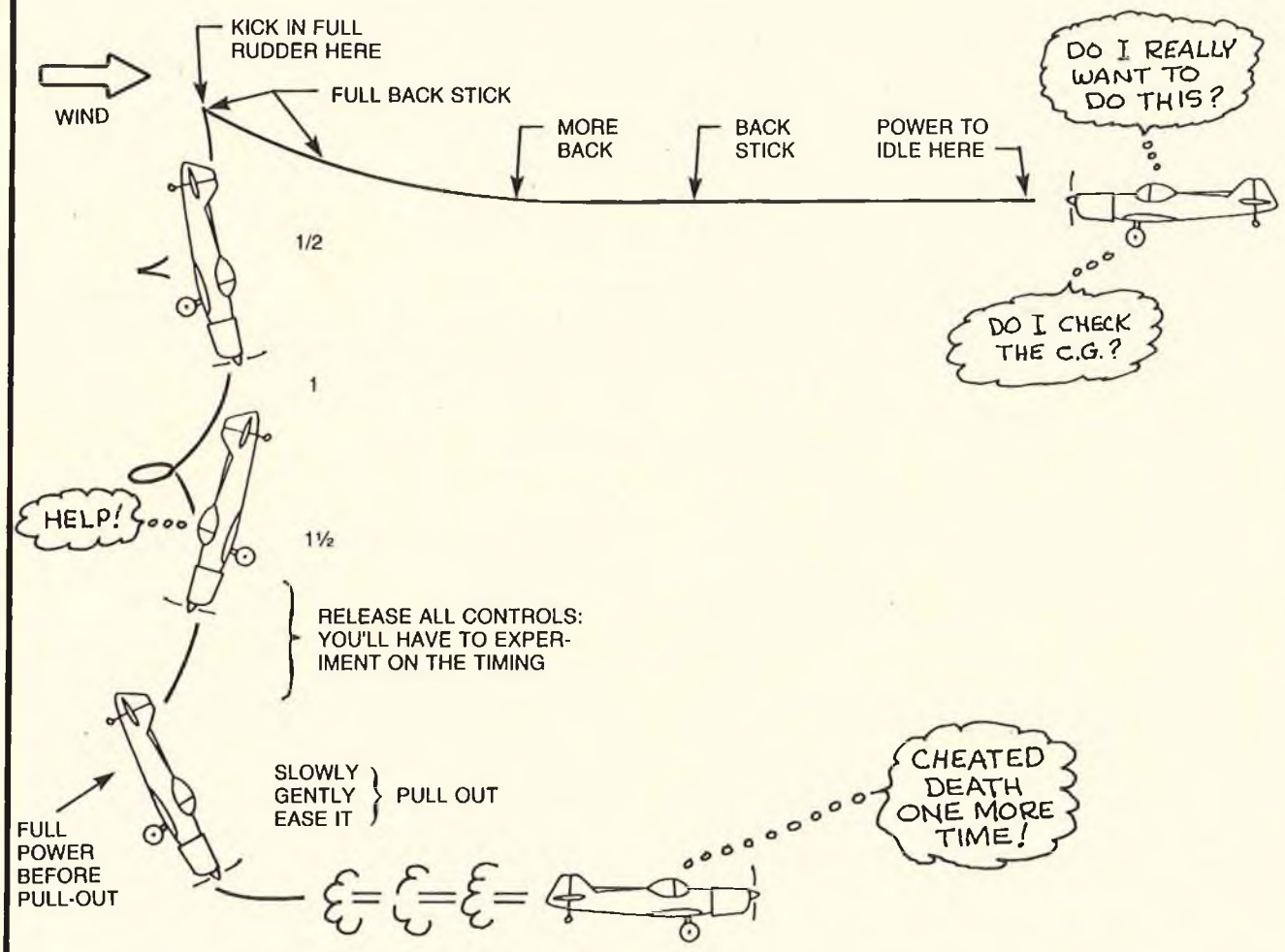
SPORT AEROBATICS

By Roger Tennyson

I ought to read my own stuff. Shortly after mixing air and ink for the last article, I arrived at the field for the test flight of my new Zlin 526. After three months of building a 6 pound 11 ounce four-stroke powered beauty, I was **ready.** The airplane lasted eight, maybe ten seconds. The pieces that we picked up would fit into the left-over MacDonald's bags from our trash cans. Adverse yaw, a stall, a spiral dive --- ailerons worked (wing didn't). Back stick (dummy) and **in.** Four strokes don't seem to develop enough power to get a big 'un much past stalling speed; must have been flying on the center section. Oh well, live and learn. The worst part was telling my poor wife who suffers through my building as the back yard goes neglected. Think I better fly the old Zlin for awhile --- and fix the back fence.

Back to work. This month we'll take up the snap and the spin . . . the two maneuvers we flew into accidentally last month. Only this time we'll do them on purpose, and under control. I'll also introduce a new concept to you; the tear-out sheet with diagrams. In the months which follow, I'll diagram each maneuver pair so that you can build a binder to take to the field for your practice. You'll find, as I do, that notes are invaluable if you

THE PRECISION SPIN



ON FIRST SPINS, GET THE HELL UP IN THE AIR!

CHECK YOUR IDLE SPEED ON A FEW SLOW, NOSE-UP FLIGHT APPROACHES BEFORE YOU TRY THE FIRST SPIN.

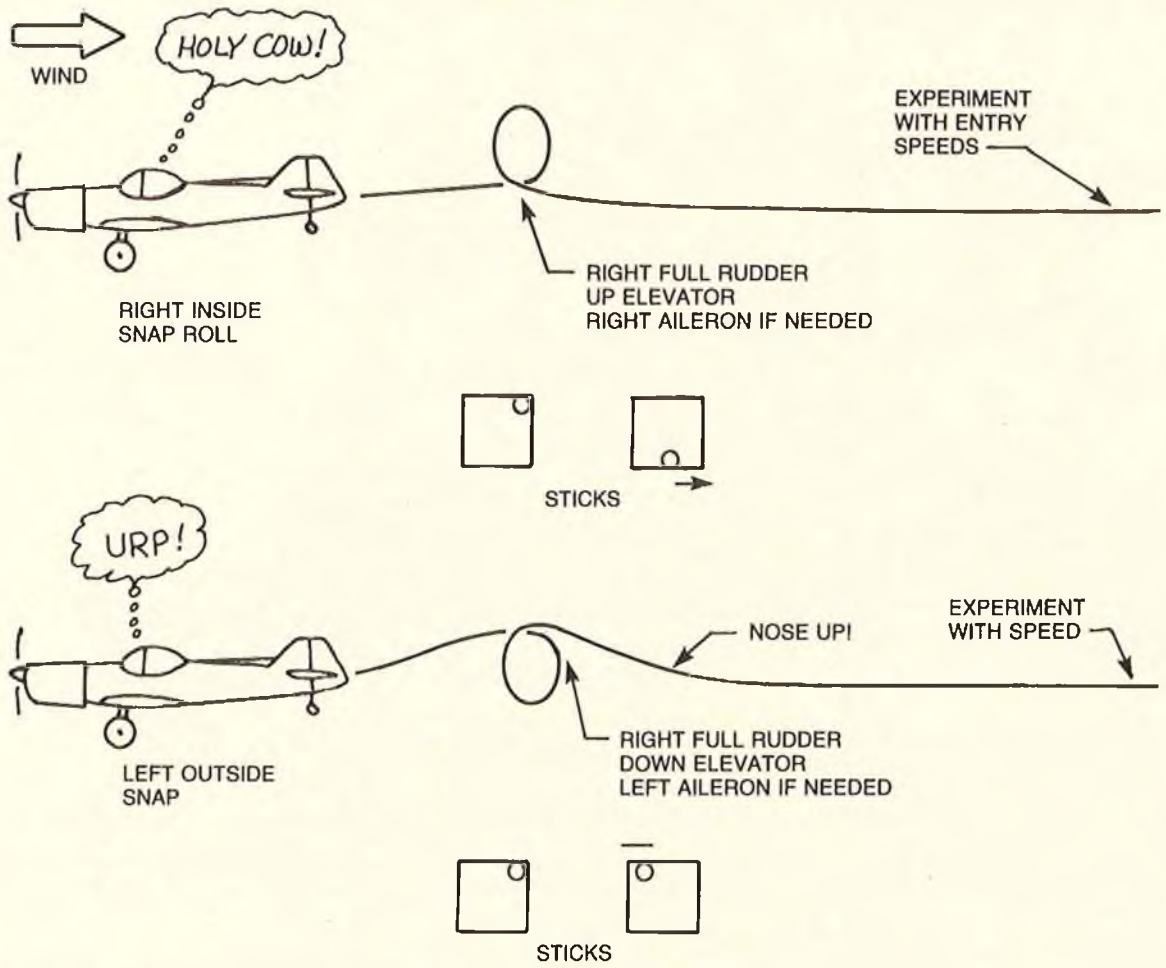
IN-SPIN AILERON SPEEDS UP THE WHOLE SHEBANG. OUT-SPIN AILERON SLOWS YOU DOWN. APPLY AFTER SPIN HAS STARTED.

DON'T HORSE IT IN. LET THE PLANE STALL AND BEGIN TO DROP BEFORE YOU KICK IN THE RUDDER.

DON'T TRY TO STOP THE SPIN WITH FANCY APPLICATION OF OPPOSITE RUDDER. YOU'LL LIKELY OVERCONTROL AND SNAP ROLL THE OTHER WAY. LET THE CENTERING OF THE SERVOS DO IT FOR YOU.

GET THE DIVE STABILIZED BEFORE YOU PULL OUT. EASY DOES IT ON THE PULL-OUT.

THE SNAP ROLL



MORE ELEVATOR SPEEDS THINGS UP, MAKING ROLLS MORE VIOLENT.

TRY TO GET ALONG WITHOUT AILERON IF YOU CAN.

IF YOU CAN'T GET THE PLANE TO SNAP, ADD MORE ELEVATOR TRAVEL, BUT BEWARE OF GETTING SO MUCH THAT YOU CREATE A SQUIRREL OUT OF YOUR OLD FRIEND.

IF IT WON'T SNAP TO THE RIGHT, DON'T BE STUBBORN. GO LEFT. SOME PLANES SPIN LEFT AND SNAP RIGHT. C'EST LA VIE.

plan to get anywhere. The old brain just can't store all the **right stuff.**

The **spin** and the **snap** are related, of course. The spin is a vertical snap roll, or probably better put, the snap is a horizontal spin. The difference between a spin and a spiral dive is the same as that between a snap roll and a barrel roll. The spin/snaps are **stalled** maneuvers. Even though aileron control can be used (and, in some ships, is mandatory) to do the snap/spin maneuvers, the **primary and principal** control in these will always be the **elevator.** It is the elevator which dictates not only the **difference** between the spiral and the snap, but also the **rate** at which the maneuver occurs. The more elevator you use, the faster you go around. As we have said previously, you want enough elevator travel in your ship to get the job done, and not much more. In the snap maneuver, you may use the dual rate, but you won't need it and **shouldn't use it** in the spin, lest you get into the accelerated stall problems we discussed in the last article.

So work on your elevtor clevis on the ground. Go up to try the spin and the snap. If the aircraft won't snap, add more movement until it will. It is the rare aerobatic type that won't snap if it has enough elevator throw. Experiment with your throttle setting and your timing (when do I throw everything into the corner after I hit full elevator?), but I don't recommend that you experiment with the C.G. unless you are a real expert. It's true that you can get **anything** to snap if you move the C.G. far enough aft. The problem is that you may get a snap when you least need it . . . like on a landing approach. Stick to the plans.

You may **need aileron.** Strictly speaking, you should need only elevator and rudder to snap or spin, but with some models, you won't get a clean snap unless you do use aileron control. Don't demand that you be a purist. Use what you need to get the job done. I, personally, do not like to use aileron in the spin, because it tends to make them "wind up." It is hard to count a fast spin properly to stop on a heading. And out-spin aileron (aileron against the spin, i.e., cross-controlled) can in some models cause you to go **flat.** If the C.G. is correctly placed, a flat spin is extremely unlikely, and out-spin aileron is a good way to slow the spin if you are having trouble counting or

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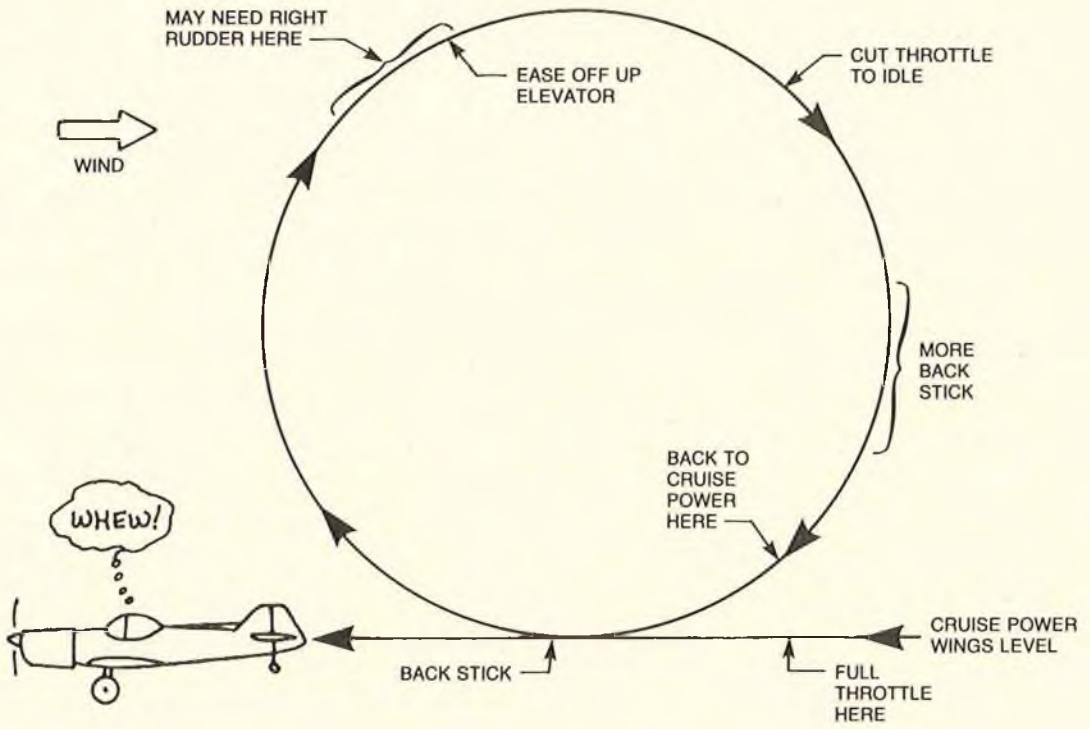
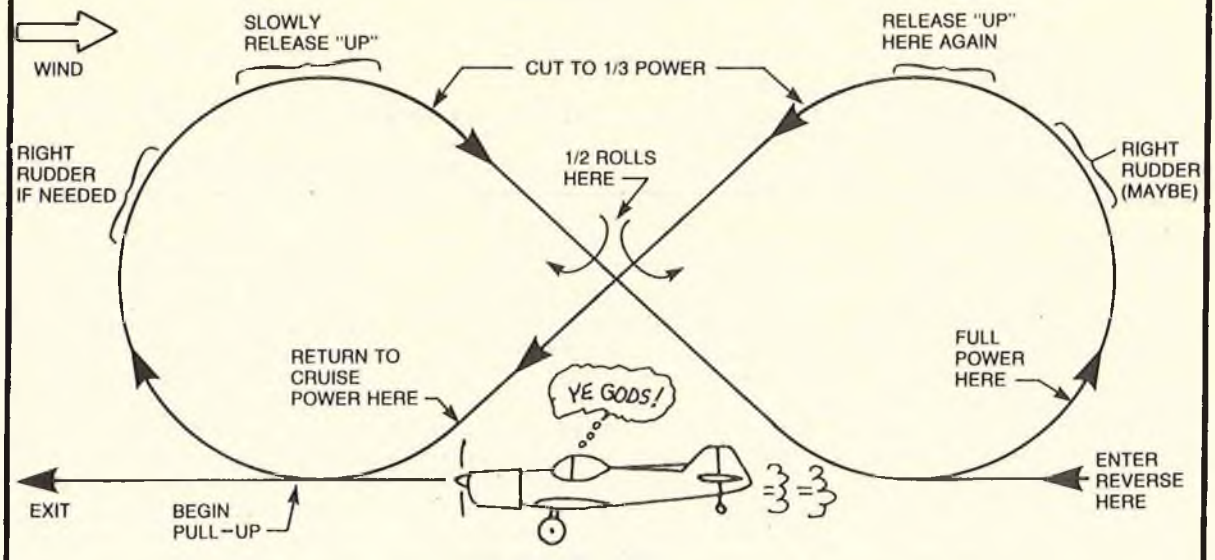
THE LOOP



NOTES: MAKE ALL STICK AND POWER CHANGES AS GRADUALLY AS YOU CAN.
WINGS LEVEL IS THE KEY.
DON'T CUT POWER UNTIL YOU'RE WELL "OVER THE TOP."
TIME RUDDER APPLICATION WITH SPEED LOSS. BE PREPARED TO USE LEFT RUDDER WHEN POWER COMES BACK ON.

THE CUBAN EIGHT



ENTER HERE — ADD FULL POWER FROM CRUISE POWER APPROACH

POINTS TO REMEMBER:

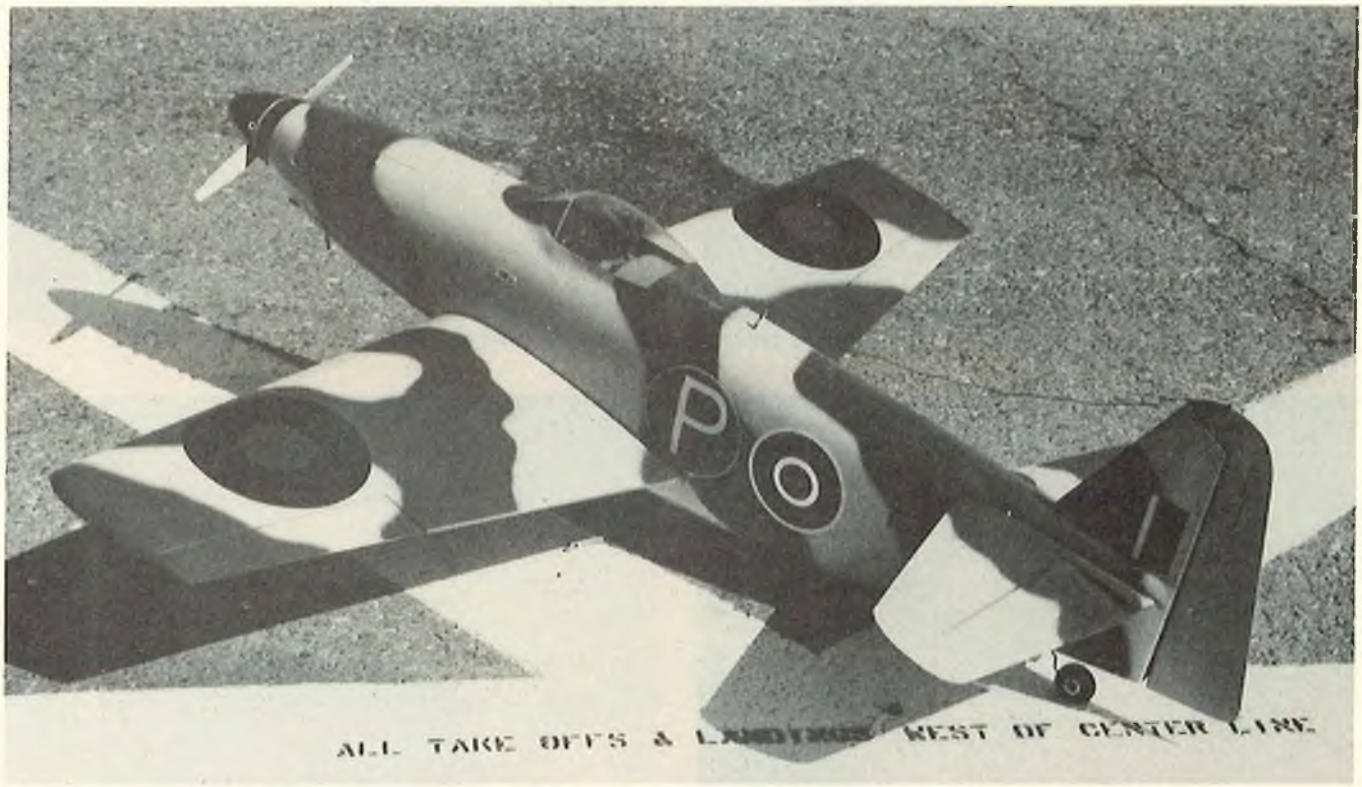
WINGS MUST BE DEAD LEVEL UPON ENTRY.

DON'T RUSH THE ROLLS. THE MOST COMMON MISTAKE IS TO ROLL TOO EARLY. LET THE NOSE DROP WELL THROUGH. REMEMBER WHERE YOU ROLLED LAST TIME AND TRY TO HIT THE SPOT ON THE NEXT CROSS-OVER.

DON'T FORGET TO PRACTICE IN BOTH DIRECTIONS. AND WHEN YOU FEEL LIKE A HOT ROCK, TRY THE REVERSE CUBAN EIGHT. YOU ENTER AS SHOWN, AND THE ROLLS OCCUR WHEN YOU GO UP.

REMEMBER THAT: YOU CORRECT HEADING WITH AILERON, AND YAW DRIFT WITH RUDDER.

GLASS CLOTH



COVERING TECHNIQUES

By Dan Parsons

In my business of selling lightweight glass cloth and during my many trips to fly in scale contests and scale fly-ins I receive many questions on covering techniques using the lightweight glass cloth. After four years of covering all of my planes with glass cloth and resin I have settled on a technique that I find the best for me and I'm sure will work very staisfactorily for most modelers. All the feedback I have received indicates a very high level of satisfaction from the modelers who have tried it.

First, I want to discuss the advantages of using lightweight glass cloth and resin for covering a model. The number one advantage, in my mind, is the speed and ease with which a model can be covered, especially where compound curves are involved. Other important advantages are: little or no shrinking and no loosening of the covering over the life of the model; production of extremely durable, sealed surfaces and no "bridging across" or unwanted filleting as often occurs when using fabrics and dope, i.e., at the interface between the fuselage and the vertical stablilizer. I want to point out that glass cloth and resin can be used only over solid or sheeted surfaces, not over open structure. This is of course, because the glass cloth cannot be shrunk tight after stretching over an open structure.

There are several binders that are used to lay the glass cloth to the model's surface. The ones most generally used are: epoxy resin, polyester resin, and Super Poxy clear paint.

I prefer epoxy over the polyester resin for two reasons; epoxy shrinks much less during the cure and it has little or no odor. Some modelers worry about the sandability of epoxy relative to polyester. My experience has been that, properly mixed and cured, epoxy sands just as well as polyester.

Now, into my techniques for covering a model with lightweight glass cloth and epoxy resin. Of course, I am using the 0.6 oz. per sq .yd. glass cloth that I sell in 5 and 10 yd. lengths.

All surfaces of the model that are to be covered should be sanded reasonably smooth.

I'll start with the wing first, bottom surface. Cut a piece of glass cloth long enough to allow at least a 6" overlap over the center section and wide enough to provide a 1" to 2" overlap of the leading and trailing edges and the tip. (Lay the cloth over the dry wing surface and remove any large and obvious overlaps or wrinkles — this is not critical.)

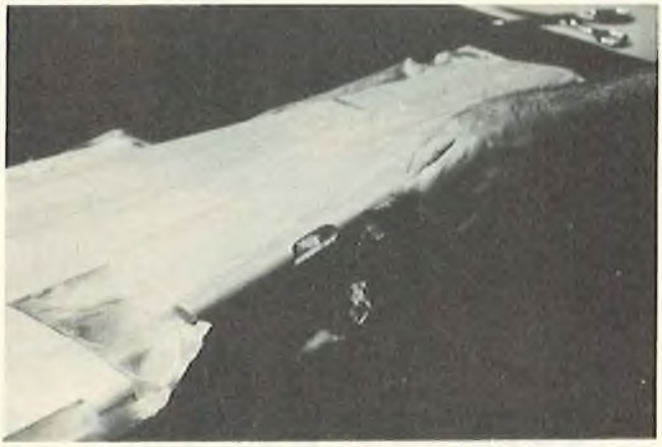
Mix your epoxy, being careful to obtain an accurate mix (some epoxies are quite sensitive to the proper mix formula — won't cure properly otherwise). I usually mix no more than 1 oz. at a time because of pot time; however, with the rapid application possible by brushing thinned epoxy, mixing larger quantities is certainly feasible. Since you are going to brush on the epoxy over the cloth, the epoxy must be thinned with acetone. A 50-50 mixture works fine but this is not critical. I use brushes from 1" to 2" wide, depending on the size of the surface.

Back to the wing. First, brush the epoxy over the end of the glass cloth in the wing center section (this is to "tie" it down) then just start brushing the epoxy over the cloth in a span-wise direction towards the tip. Just as fast as you can brush, you will be smoothly

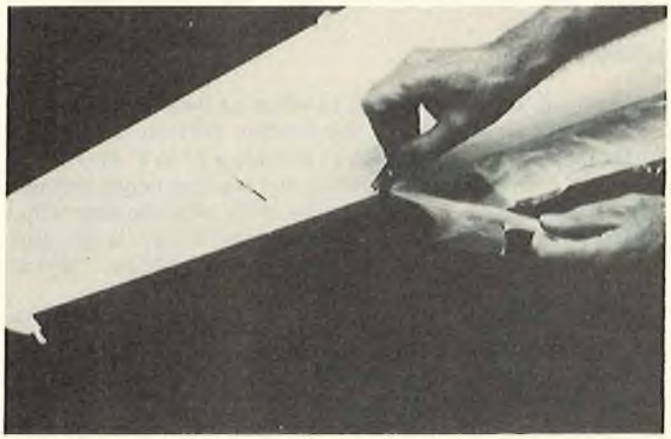
Glass cloth layed out over half of wing before applying epoxy. Bottom surface is covered first.

Brushing thinned epoxy over cloth at center section.

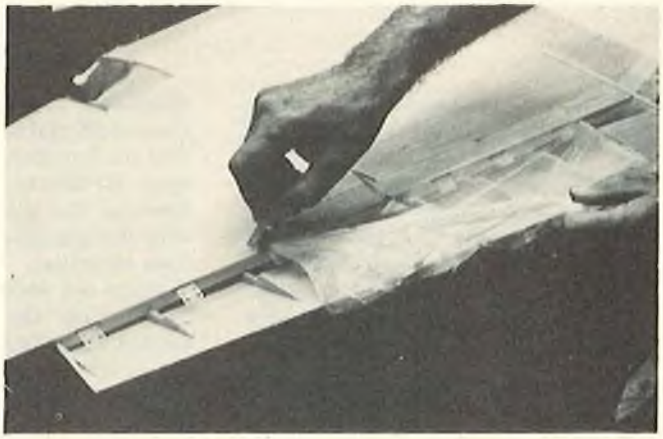
Brushing thinned epoxy spanwise over cloth. Work from center toward edges.



Trimming cloth along leading edge of wing after applying the thinned epoxy.



Trimming cloth along trailing edge after the epoxy has cured.

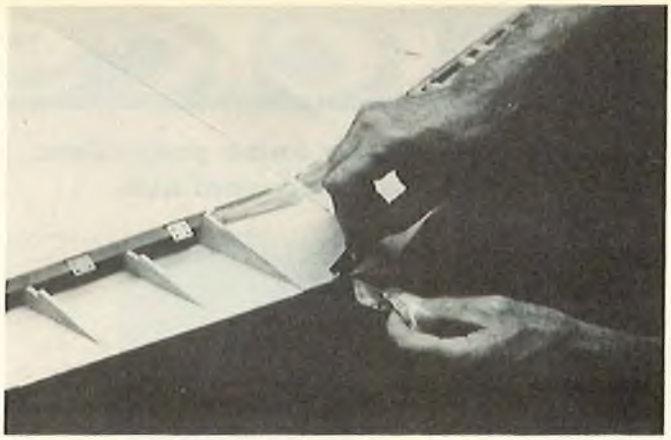


Trimming cloth along edge of split flap area after the epoxy has cured.

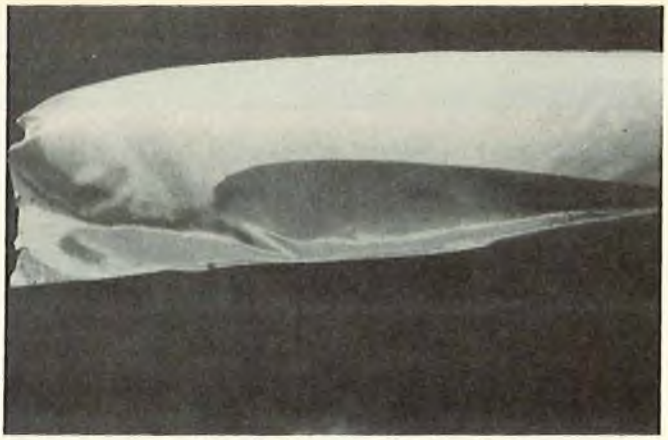
laying that cloth down to the wing surface. After you've reached the tip (in just 2 or 3 minutes), take a razor blade and trim the cloth just below the leading edge, around the tip to the trailing edge. Here the razor blade is going through the cloth into the leading edge and tip wood. Do not trim along the trailing edge; this will be done much easier after the epoxy has cured. By thinning and brushing on the epoxy you will find that you end up with a smooth surface with no excess epoxy that has to be "sopped" up or scraped off.

After the 24 hour curing period, the other half of the bottom surface of the wing is ready for covering. The center section overlap edge of cloth should be smoothed by light sanding with 180 paper, then follow the same procedure for the other half of the bottom of the wing.

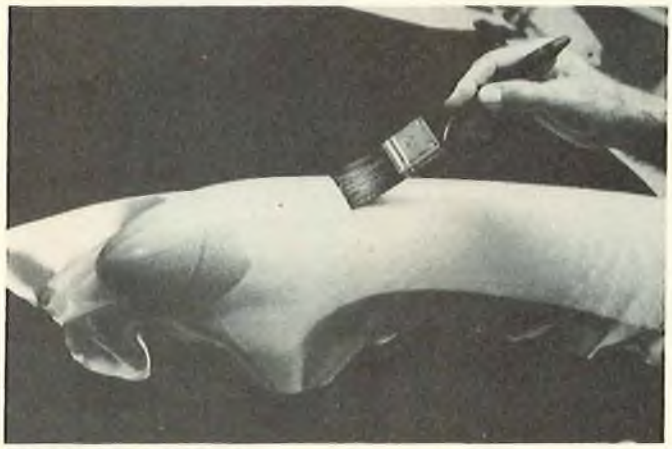
Before covering the top surface of the wing, the leading edge and tips where you trimmed the bottom glass cloth should also be smoothed by light sanding with 180 paper. Cut out pieces of cloth for the top surfaces of the wing just like you did for the bottom surfaces, lay the cloth on center to tip and "paint" on the thinned epoxy as before. Trim along the leading edge and around the tip with scissors, allowing enough of the glass cloth to overlap the glass cloth edges from the bottom covering. Again, do not trim the trailing edge until the epoxy has cured. Also, do not forget to overlap both halves of the cloth in the center section. This double overlap adds lots of strength to the center section joint



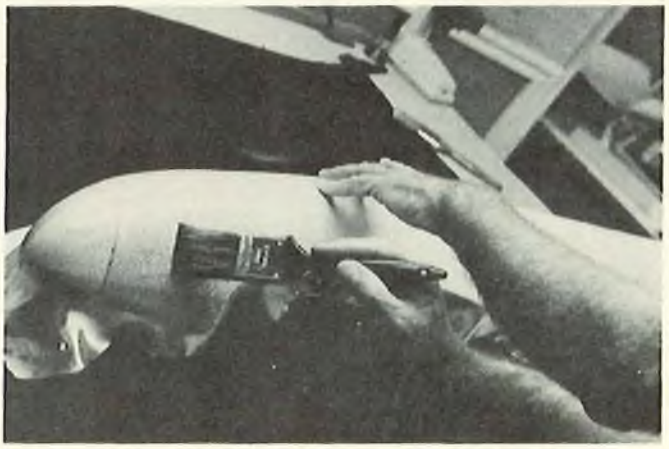
Trimming cloth along the center trailing edge after the epoxy has cured.



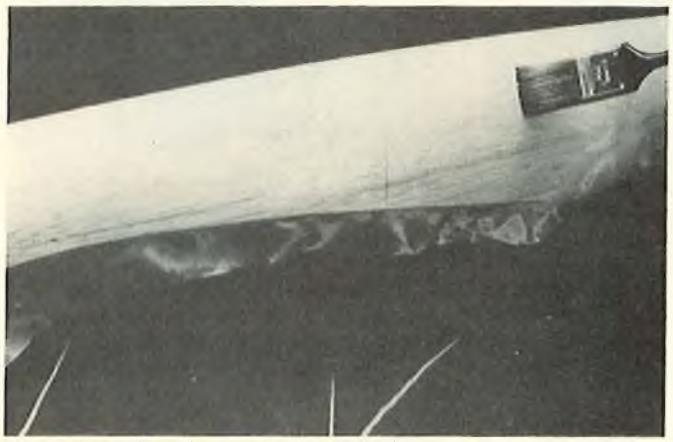
Glass cloth layed over fuselage before applying epoxy.



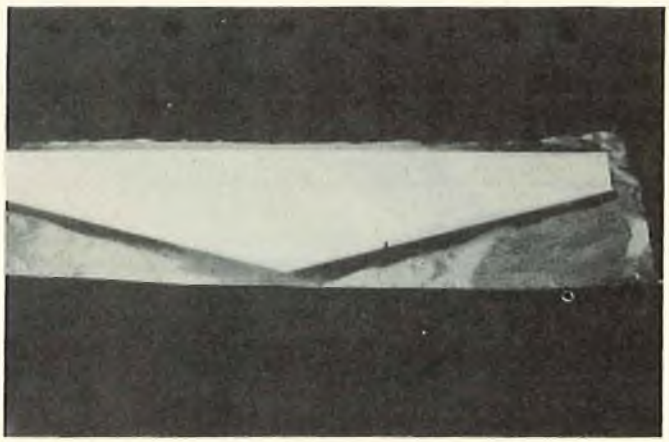
Brushing thinned epoxy over cloth on nose of the fuselage.



Brushing thinned epoxy over cloth down the side of the fuselage.



Brushing thinned epoxy over cloth farther aft on side of the fuselage.



Glass cloth layed over horizontal stab before applying epoxy.

and no further reinforcing is necessary. The top and bottom surfaces of the wing could be covered with one piece of cloth but I prefer the two piece method.

The one-lay-down coat of epoxy does not completely fill the cloth so a fill coat is required. After the 24 hour cure period, I brush on a second coat of thinned epoxy. Note: Do not sand after the first lay-down coat of epoxy — it isn't necessary and you will likely cut many of the unfilled glass cloth fibers if you do sand. This second coat of epoxy should completely fill the cloth with some overlay which will allow sanding to a smooth surface without sanding into any of the glass fibers.

The tail surfaces are covered in the same manner as the wing except that the horizontal stabilizer should be covered with a continuous piece of cloth tip to tip.

Now to the fuselage, and here is where the glass cloth covering technique really shines because of the irregular shape of fuselages. I cover my fuselages in one continuous piece of glass cloth — here's how. Cut out a piece of cloth long enough to cover the fuselage from nose to tial and wide enough to wrap completely around the fuselage. With the fuselage in the upright position on the bench, drape the glass cloth over the top of the fuselage from nose to tail. Starting at the top of the nose with the thinned epoxy, start brushing and work aft towards the tail also applying to the sides and bottom as you go along. You will find the glass cloth laying down

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SNOFLI

By Gordon Pearson

Dave Henshaw, LSF National Coordinator, Canada.

Ken Bates launching his Caproni.

Going for a spot in the snow.

Chet Tuthill. Note the bijou boots.

Mr. C.D. himself, Warren Tlahrt, reporting "Let's fly — the weather is not going to get any better." — It didn't.

Who was that masked man? Ken Bates, flying wing fame, trying to keep his beard from getting frost bitten.

The Greater Detroit Soaring and Hiking Society annually begin the contest season in the midwest with the Sno Fli, which, by now, is legend. We have been graced in years gone by with every kind of weather there is in the book for February in Detroit. To give the reader from the deep south and the likes of California some idea of what we mid-westerners go through to "enjoy" our sport, let me enlighten you. Two weeks prior to this major soaring event the Michigan Radio Control Society (MARCS) put on a club contest to prep ourselves for the weather and competition. My first launch with an Aquila XL resulted in a wing literally blowing apart on launch. The post mortum revealed

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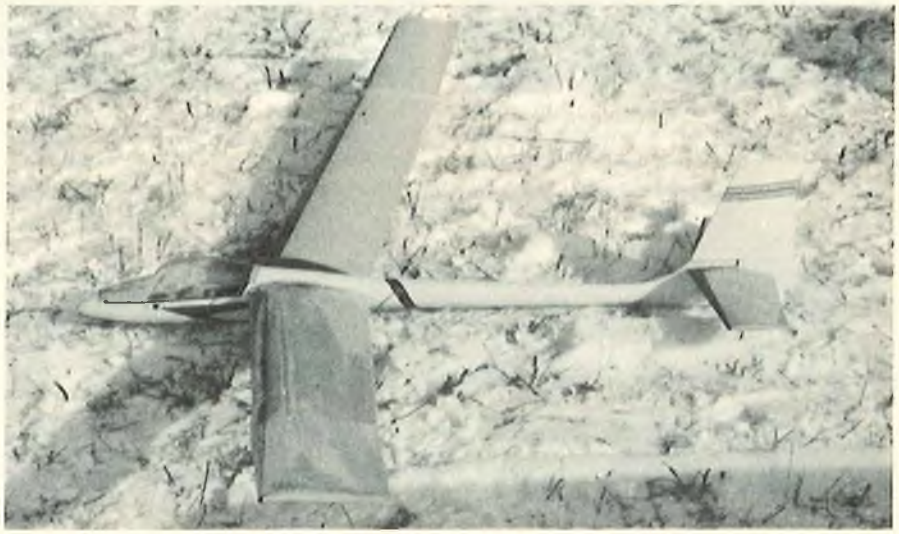
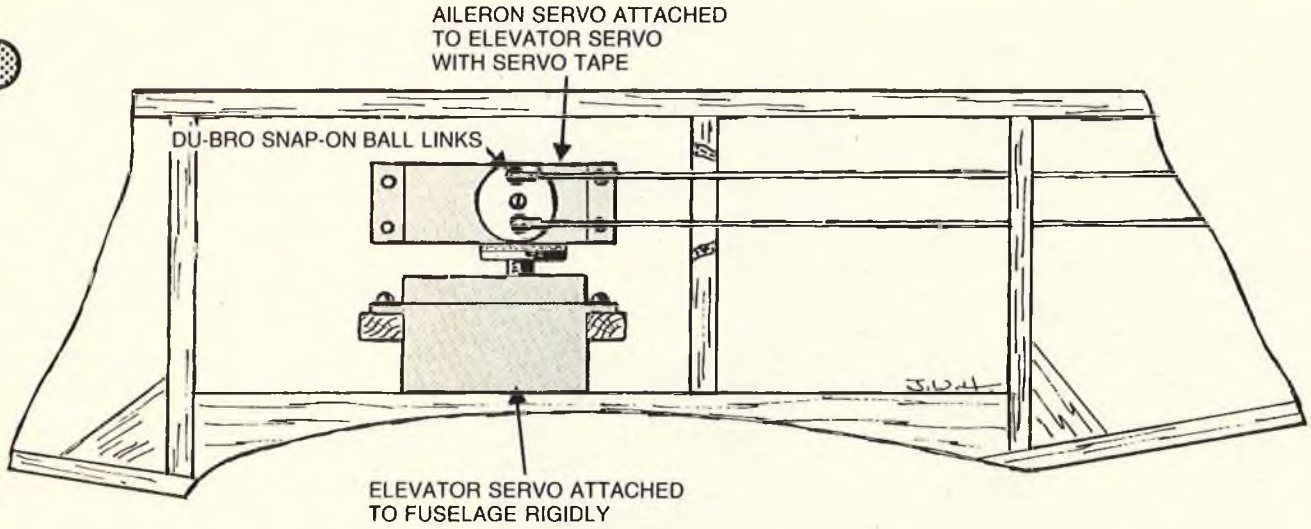


The cumulus is still alive and well.

FOR WHAT IT'S WORTH



SKETCH OF THE "YASFOA/EBMCI" INSTALLATION

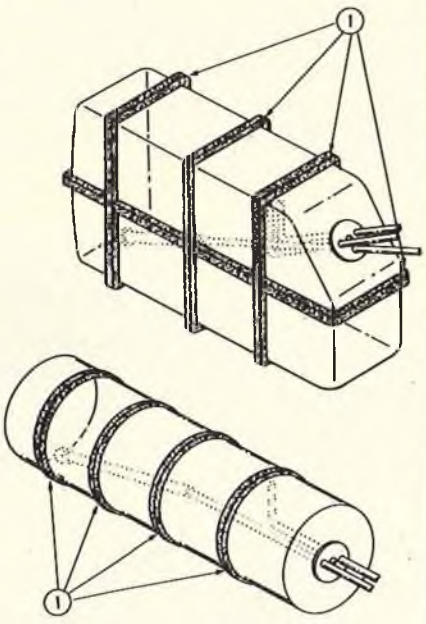
Yet another scheme for operating ailerons/elevators by mixing control inputs comes from Jack Headley of Rancho Palos Verdes, California. This is surely the simplest of control mixers, where ailerons or elevator functions are required from a single set of control surfaces. Naturally, it can also be used on Vee tailed models. The sketch illustrates the basic idea. The elevator servo is attached firmly into the fuselage by screwing it onto a couple of hardwood beams. This servo has a large wheel on the output shaft, and the other servo is attached to this wheel with servo tape. The "differential" servo is coupled up to the control surfaces by the normal pushrods, which are attached to the servo with Du-Bro Snap-On ball links. These links are the secret of the operation of this scheme, as they permit the elevator servo to rock the aileron servo through quite a large angle without binding. The sketch shows the preferred way of assembling the set-up, with the weight of the top servo being directly supported by the fixed servo. (Laying the elevator servo down would put a bending load on the fixed servo output shaft.)

Phillip Ammann of Deepwater, Missouri, tell us how to glue those ABS plastic parts together so they will stay. He uses Parabond P-28 cement product #280 which is the same cement that is used to glue plastic water pipes together. It can be used on CPVC, PVC and ABS plastics. He has used it on plastic cowls, wheel pants and top decks. Phillip states he has never had one come apart once it sticks, when it is cured it's there to stay.

Al Alman, Arlington, Texas, tells us that everyone knows about using Rit dye to tint canopies, but another idea is to color coordinate all the nylon accessories; horns, clevises, etc. These can also be soaked in the dye of your choice to mix and match colors so that the glaring white color of the nylon doesn't stick out like a sore thumb, especially on scale-type planes where horns and other items are on the outside.

An aid in finding models that go down in corn fields or behind the tree lines is recommended by Ed Baltera of Absecon, New Jersey. He fastens a small compass in a convenient spot on his transmitter with double-face tape. When the model gets away from him, he points the transmitter antenna toward the spot where the model went down, takes a compass reading, and has a handy directional reference while going to retrieve it.

Morris D. Vickroy of East Moline, Illinois, sent in this problem solving idea. Morris uses Sig Wing Mount Foam Tape to insulate the tank from the aircraft frame to prevent foaming of the fuel. It has been successful in every installation, especially in tight situations where there isn't much room when using large tanks in narrow fuselages. See accompanying sketch.

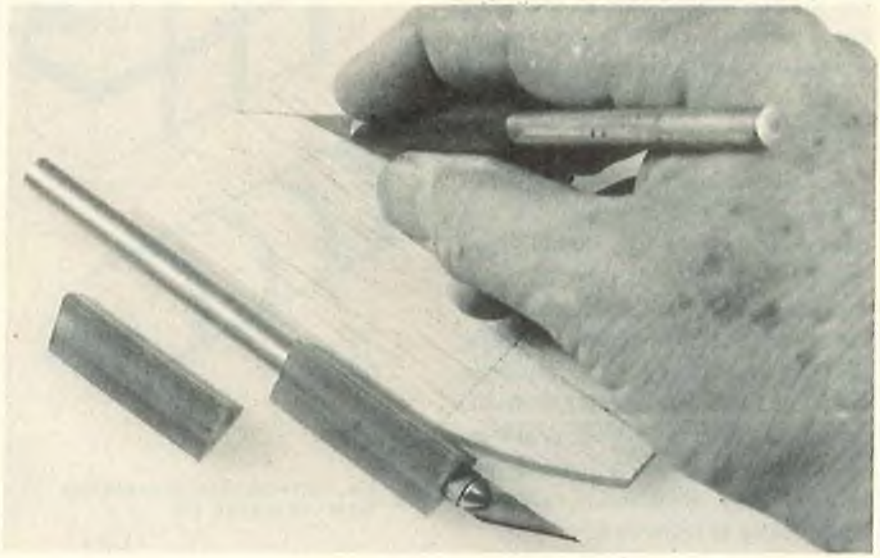


(1) sig polyurethane wing cushion foam no. SH546 1/4"

FOR WHAT IT'S WORTH

For those modelers who buy their fuel in 5 gallon quantities, a tidy method of dispensing the fuel into a handier 1 gallon can is with a funnel cut from the upper portion of an empty 2 liter plastic soft drink bottle as shown in the photo. A hack saw will easily cut the plastic. The top threads must be filed down a bit so that it will screw into the neck of the can for a sturdy, leakproof fit. We have had dozens of suggestions to use the bottle base cover for cowlings on small models and several suggestions for making canopies from the top shoulder of the bottle. This idea was submitted by Cedric Galloway, Hesperia, California.

This handy workbench item keeps your two part epoxy glue and mixing sticks together and ready for immediate use. Three small size tin cans (not aluminum) are soldered together along the rims, top and bottom, in a triangular arrangement as shown in the photo. Spray on a coat of paint for a clean look and identify for parts A and B. Stow the epoxy containers inverted with the mixing sticks in the third can and it's ready when you are. This idea was submitted by MSgt. Kenyon L. Frey, APO, New York.

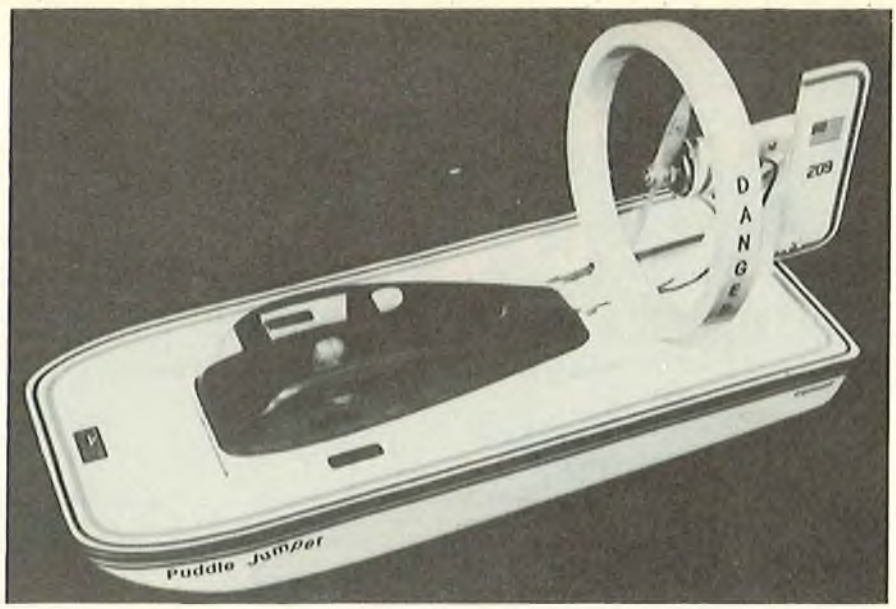


The soft triangular strips designed to assist children with their handwriting will fit an X-Acto knife. It will provide a more comfortable grip and the knife will not roll off the workbench. Who else has had an X-Acto stick in their foot? The strips are found in stores that sell school supplies. See accompanying photo. This good idea was sent in by Tom Thacker, President, Atlanta Drone Society, Decatur, Georgia.

Send your hints & kinks to R/C Modeler, P.O. Box 487, Sierra Madre, Ca. 91024 & win a free book from RCM's Anthology Library Series if your idea is used.

The ELECTRIC PUDDLE JUMPER

By
Dave Andres &
Ken Willard



Puddle Jumper with Astro 02 electric motor, ready to go. Prop is a Cox 5/3.

It was a hot summer night. Calm. The water in the channel was practically still. I was visiting my friend Ken Wathen up at Clear Lake Oaks. He has a place on the waterfront of a channel with his boat dock nestled up against his bank.

We decided to have some fun. He called his neighbor on the other side of the channel.

"Hi. Thought you'd like an after dinner drink. Go down to your boat dock and I'll send one over."

"Huh?"

"Don't ask questions; y'wanna drink or don't ya?"

"Okay, I'll go along with you, but it sounds like you might have had too much already!"

So we went down on Ken's dock with my newly completed electric powered Puddle Jumper, put a small glass of wine up on the bow, and when the neighbor appeared on his dock, I moved the throttle forward, and the Puddle Jumper went cruising across the channel. About half way across, I turned on my tape recorder and played "Anchors Aweigh."

The neighbor watched. You should have seen the expression of disbelief on his face (the channel is only about 100' wide).

When the Puddle Jumper approached the dock, I throttled back, brought it alongside and shut it off. He reached down, picked up the glass, and I put power to the airboat and brought it back.

The neighbor raised the glass, took a drink, and said, "Hey, great! I gotta admit I never had a drink delivered to me that way!" We laughed so hard we nearly fell in the drink.

They're still talking about it up there at Clear Lake.

So how come the old Chief Sunday Flier has an electric Puddle Jumper? Let me explain.

I was working on another project involving this intriguing little airboat manufactured by Sterling Models, and in the process I said to myself, "Why not make it electric powered so I can run it in my pool without getting the water all messed up with fuel?" I had an Astro .020 electric motor. All I needed was a control for it.

San Antonio Hobbies has a full supply of electric powered boats, cars, and airplanes, so I went down to see what was available. I wanted a unit that would give variable speed and both forward and reverse.

The young man at the counter showed me a unit that would provide that flexibility.

"How much?"

"Sixty bucks, plus tax."

"Phew! That's pretty steep."

"Yes, but you just plug it in. Doesn't need a servo."

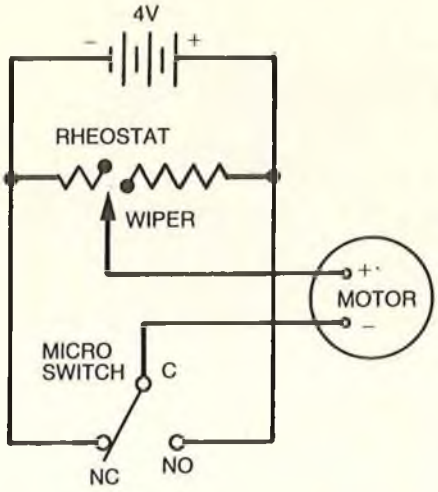


FIGURE 1
CIRCUIT DIAGRAM

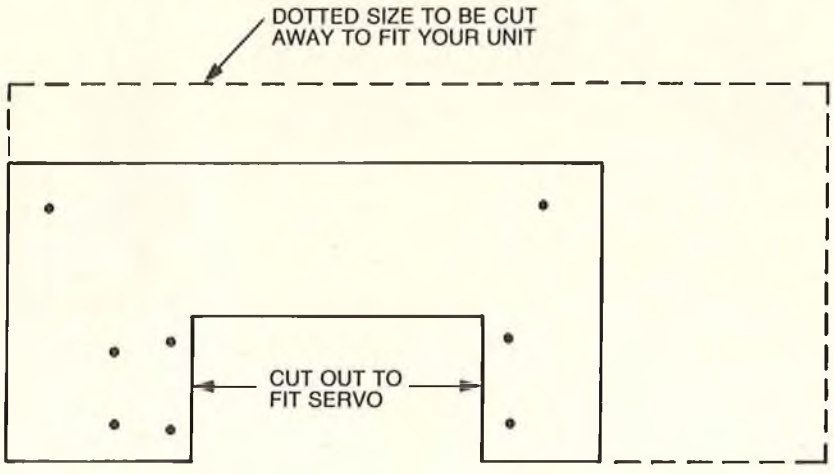
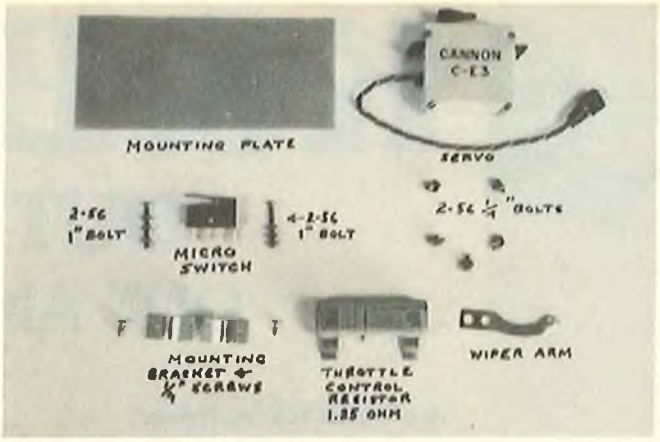
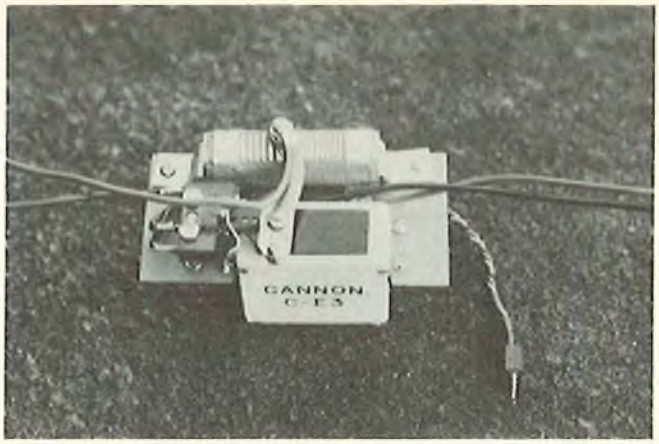


FIGURE 2
FULL SIZE MOUNTING TRAY

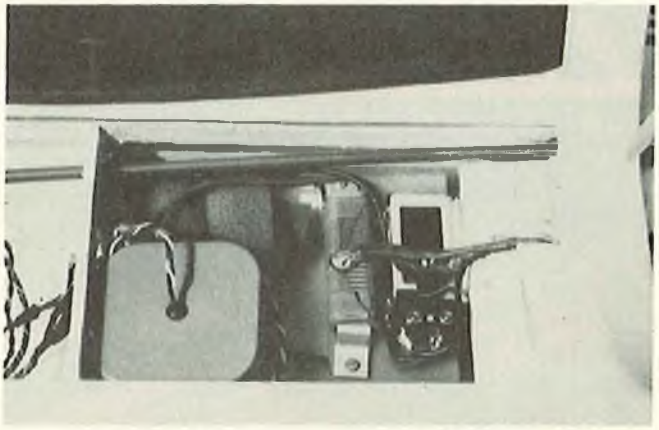


All the parts you need.

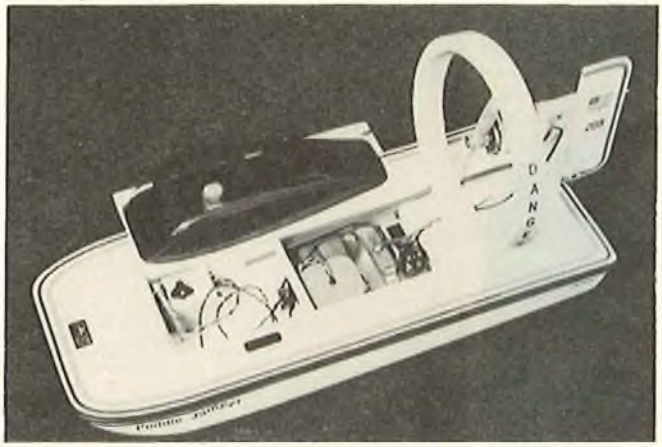


The assembled speed control unit.

Dave Andres displays his completed speed control.



Speed control installed in aft compartment of Puddle Jumper, with 1000 ma battery pack for motor, and 225 ma pack for radio (enclosed in foam).



Puddle Jumper with hatch cover removed showing full radio and motor installation.

Dave Andres tests Puddle Jumper maneuverability in Ken's pool.

"I've got several servos. What else do you have?"

"Not much. Here's a little unit I rigged up that some of my friends are using."

I looked at the unit. Neat. Compact. Simple.

"Anything like that on the market?" I asked.

"Not really."

"How much are the parts?"

"About twelve bucks," he replied.

I was fascinated — and it immediately struck me that a lot of other modelers would be.

So Dave Andres, who designed the unit, agreed to make up a parts list, circuit diagram, and put one together. I would install the unit in a Puddle Jumper, and we'd see how it worked out. The rest, as they say, is history; not earthshaking, but a fun project that will give you many hours of relaxed enjoyment.

Take a look at the photos, the parts list, and the circuit diagram. You can readily see that it is very simple to put together, with only a couple of areas where you must be careful to make the right adjustments.

Here's the construction sequence, as Dave wrote it up during the actual construction of the test unit. Let Dave tell it:

Construction Sequence For Electric Speed Control Unit For Astro 02 (or 05) Electric Motor By Dave Andres

(1) Study the pictures and diagrams.

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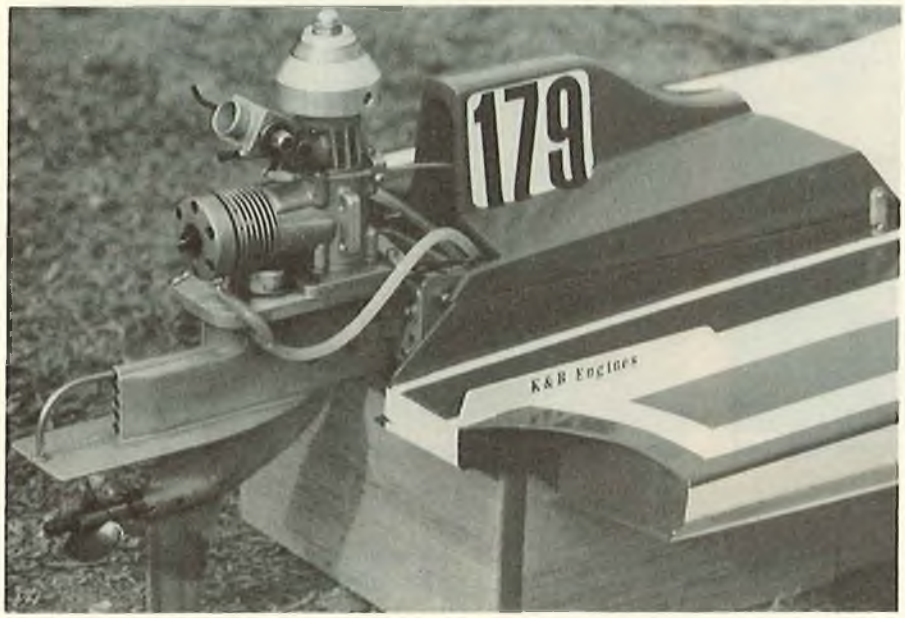
K&B OUTB

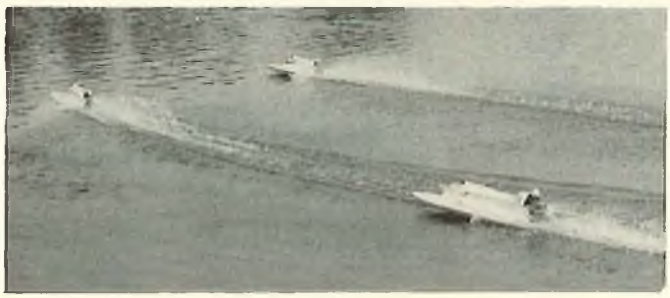
OUT AND

A plug check by Norm Teague, RCM's candidate for the title of Mr. Clean, a most meticulous boater. Norm's enthusiasm over the 7.5 is well-founded.

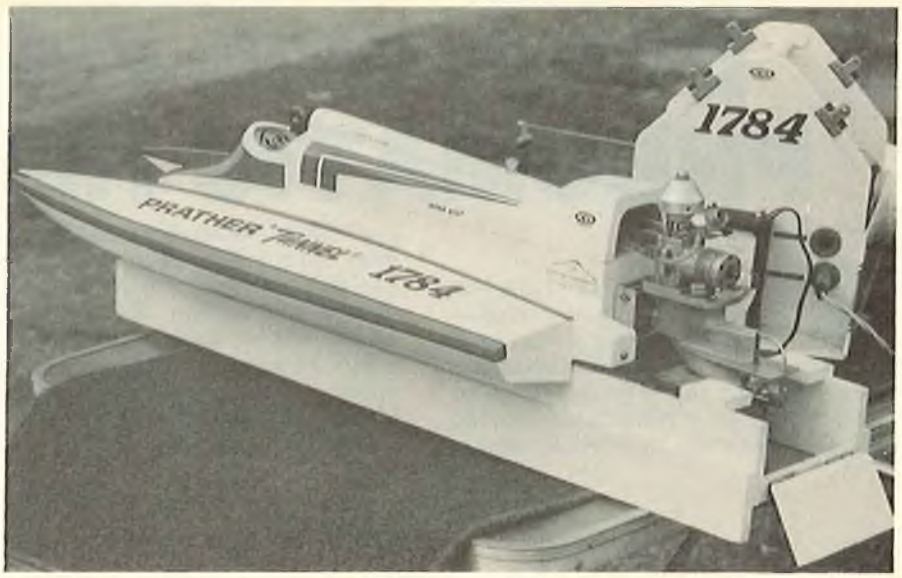
This tunnel hull for the 7.5 was designed by Jerry Dunlap. It is of wood construction and is scheduled to be kitted by Dumas in the near future. Runs beautifully.



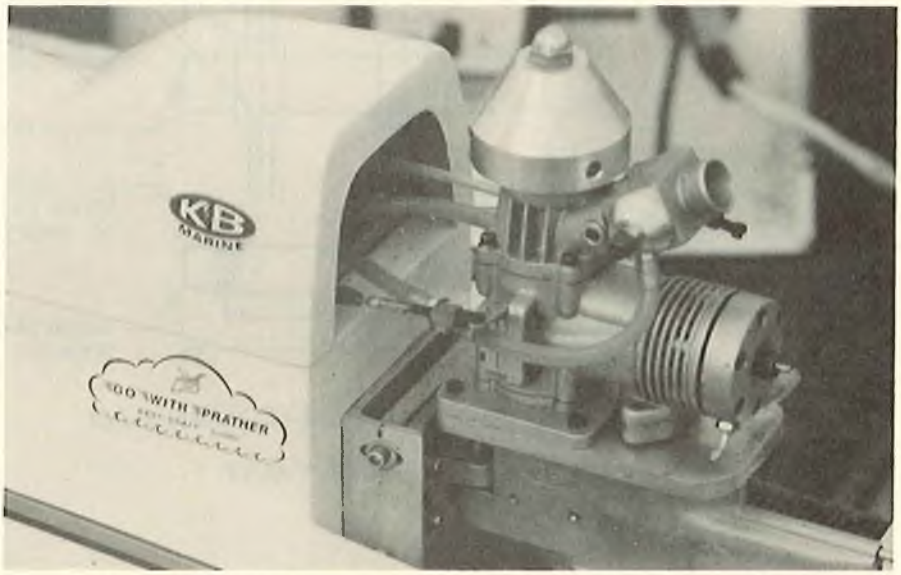
The new carburetor developed by K & B is all metal. Low speed adjustment is made with a slot head needle that screws inside throttle arm retaining nut.



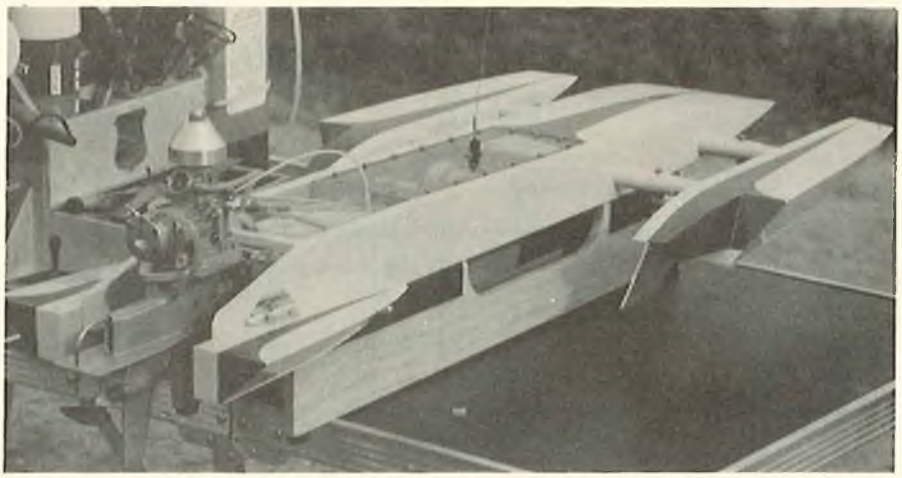
7.5
ARDS
RUNNING



Prather's tunnel hull for the 7.5 was designed by George Campbell and is available now. Epoxy/glass hull is the typical Prather high quality.



The 7.5 outboard continues the convenience of installation and maintenance established by the 3.5 outboard and provides the smooth handling of the larger class boats.



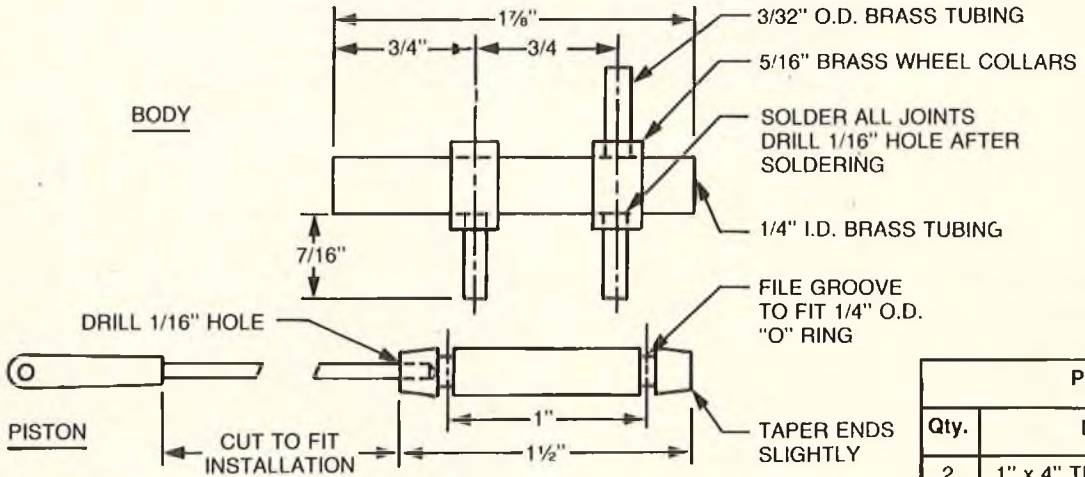
Norm Teague's hydro was designed by George Campbell and will be kitted by Prather Products. This is one speedy machine, note Norm's carburetor modification.

INFLATION FIGHTING PNEUMATIC RETRACTS

Introduction

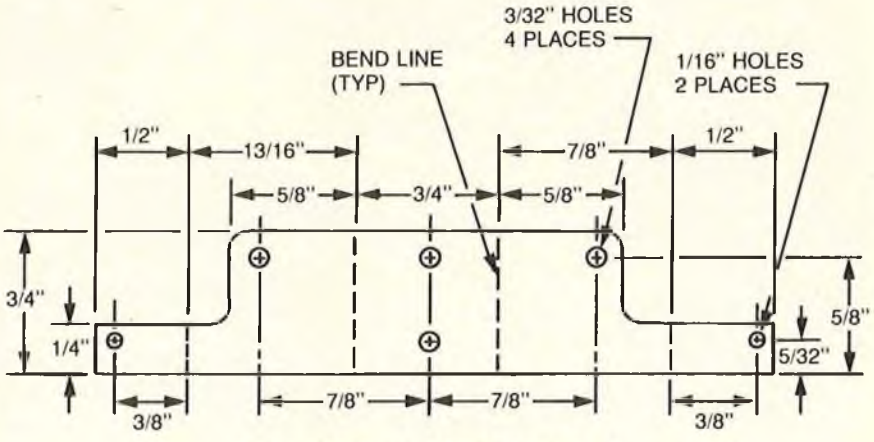
The past several years has brought about a new trend in model aircraft goodies. A nicety which has rapidly become a necessity for the serious pattern or scale flier is a retractable landing gear. There are numerous retracts available on the market today ranging from the mechanical gears like the Carl Goldberg system to the Rhom-Air pneumatic system. Each type of system has its good points and bad points. However, for the most part the pneumatic gears seem to win out when it comes to ease of installation and ability to retract large wheels.

Pneumatic gears have several advantages over a servo driven mechanical gear. The pneumatic gear is easier to install since flexible pressure lines are required instead of cumbersome pushrods and linkages. Second, a pneumatic gear can lift just about any weight of wheel without fear of stripping gears in a servo or



NOTE: MAKE PISTON FROM 1/4" ALUMINUM ROD

CONTROL VALVE



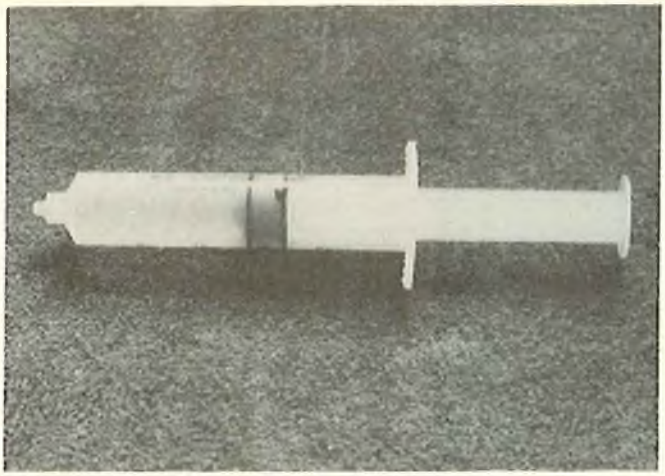
NOTE: MAKE FROM LIGHT GAGE TIN

CYLINDER SUPPORT BRACKET

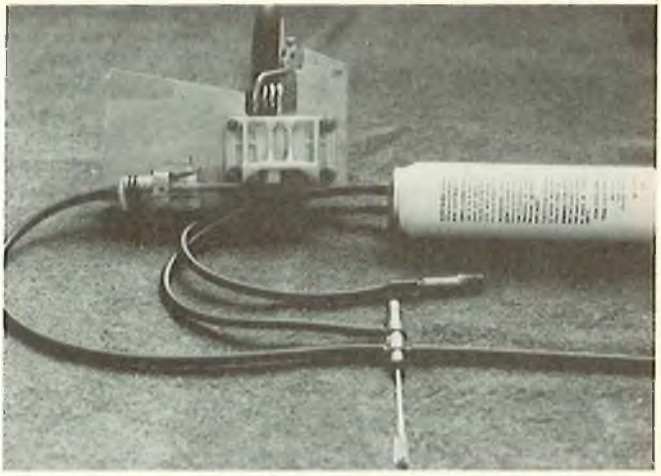
PARTS LIST	
Qty.	**Description**
2	1" x 4" THIN SHEET METAL
1	4" x 1/4" ALUMINUM ROD
1	2" x 1/4" I.D. BRASS TUBING
3	1/2" x 3/32" O.D. BRASS TUBING
2	5/16" BRASS WHEEL COLLARS
3	STEEL KWIK LINKS/RODS
8	#4 x 1/4" SHEET METAL SCREWS
1	SET TWIN GOLDBERG RETRACTS
2	1/4" O.D. "O" RINGS
2	SPRINGS — SEE NOTE
	SOLDER
	SILICONE GREASE
1	TIRE VALVE STEM
1	ACCUMULATOR TANK
	3/16" O.D. HOOK-UP LINE

NOTE:
SPRING SIZE — .022"
SPRING DIA. — .163" (APPROX. 5/32")
NUMBER OF COILS — 43 (THIS WILL DEPEND ON HOW CLOSE BUILDER FOLLOWS DRAWING)

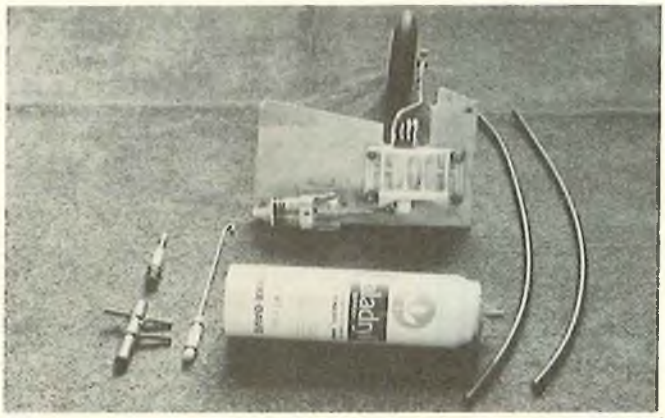
PNEUMATIC RETRACTS
CONTROL VALVE AND CYLINDER
SUPPORT BRACKET



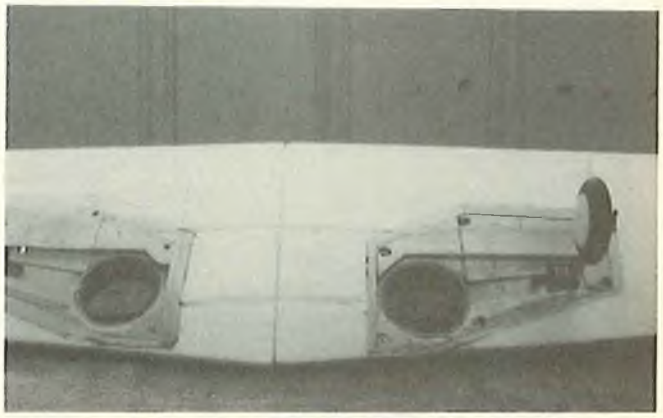
Heart of the system is a 12cc hypodermic syringe.



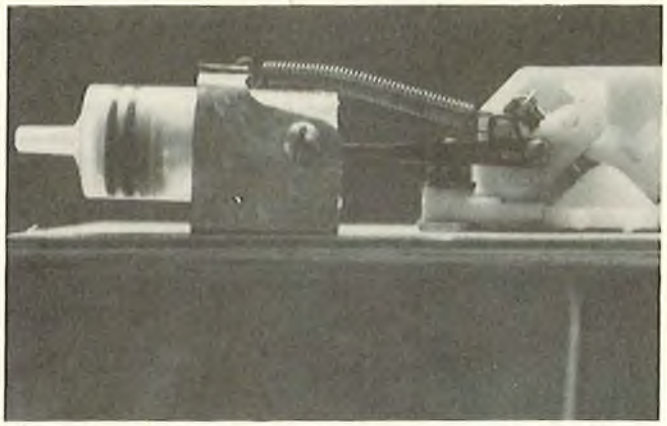
The entire system ready to install. The accumulator, actuator (syringe), tire valve, control valve and Goldberg twin gear retracts will cost less than $20.



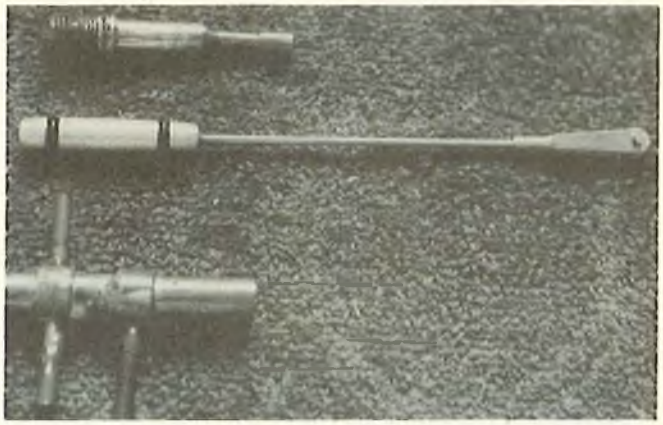
Basic parts are constructed from inexpensive common parts. Nothing expensive in this gear!



Installed in a foam wing prior to adding the wing skin. Large surface area for mounting ensures durability.



Actuator and support bracket installation are very simple. No critical dimensions exist for mounting. Just ensure nothing binds. The spring extends and lock the gear in the down position.



Basic air control consists of a simple control valve. A tire valve stem is used for charging with a common tire pump.

overloading the servo. The pneumatic gear is also very fast acting.

Unfortunately, most of the pneumatic gears are rather expensive. On the other end of the scale is the rugged and reliable Goldberg retract that is very reasonably priced. However, a high power servo system is required to make these work well with heavy wheels and struts. The question then arises: Is there some way to marry the advantages of a pneumatic gear to the inexpensive Goldberg mechanism and maintain reliability while keeping the cost at a reasonably low level? Seem like an impossible task? Well, don't give up, it can be done.

Construction:

I chose to use a two gear system for experimentation since I've been a tail dragger fan for many years. A set of Goldberg twin gears was purchased from a mail order house for less than $10. All that was needed now was the actuator.

My wife is a nurse-midwife and occasionally brings home hypodermic syringes. They looked like the perfect solution. The 12cc size was ideal. They were 1/2" in diameter and were plenty sturdy. Subsequent pressure tests showed that the seal began to leak at about 40 PSI. So, 35 PSI seemed like a reasonable maximum pressure for use

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PNEUMATIC RETRACTS

from page 87/86

in the system. At 35 PSI, the 12cc size syringe would provide about 7 pounds retraction force per gear. This was more than enough. So, an actuator was designed and fabricated using these syringes.

A storage tank was necessary. A trip to the local drug store revealed shelves of potential storage tanks. The one selected was a spray can of Calamine lotion. It was just the right size. It was constructed of a spun aluminum case with a tin top. Perfect for soldering a couple of 1/8" brass tubes to. The filler port is a tire valve assembly from an old inner tube. A small 1/8" diameter tube was soldered to this after the stem was removed from the inner tube and cleaned.

So, all the parts were present. About an hour was necessary to fit the parts together and connect them to the Goldberg retracts. Two steel Kwik Links were needed, eight #4 sheet metal screws, and some black fuel line for hoses.

The final part required was a control valve. This was fabricated from two 1/4" O.D. "O" rings purchased from the local auto parts house, a piece of 1/4" I.D. brass tubing, two wheel collars, 3/32" O.D. brass tubing for nipples, and a piece of 1/4" aluminum rod. The rod was turned down slightly by chucking it in an electric drill motor and then filing. The "O" ring grooves were then cut in the rod by using an X-Acto round file. To pressurize the system, a standard tire pump is used and pressure is monitored with a tire gauge. Maximum operating pressure is 35 PSI.

There is a slight amount of trial and error required to achieve proper operation of the gear. A spring is used to lower the gear and lock it in place. Pressure retracts it and a spring extends it. So, a spring from the junk box was selected and tried until the gear would extend and lock into place. Just progressively cut the spring until the gear will extend and lock in the down position.

This method of actuation is fail-safe. In the event a pressure leak develops or all the air is used up, the gear automatically extends. This will help preclude those embarrassing wheels-up landings.

Conclusion:

I've flown this gear in a scale P-51 for over a year with no failures. I am currently fitting another set in a .40 size pattern ship. They are easy to make, they are rugged and reliable, and best of all they are inexpensive.

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No, you don't need an electric puddle.

Any pool will do. Or you can run it on a smooth, dry surface, using the wheels. One thing's for sure.

You'll get a charge out of it.

PARTS LIST

From Hobby Shop:
1 rheostat 1.25 ohm
1 rheostat mounts
1 wiper arm
1 2" x 3" x 1/16" mounting board (wood or fiberglass)

From Electronic Shop (Radio Shack, U-Do, etc.):
1 micro switch 5A 125VAC (at least)
4 ft. 18 gauge wire

From Hardware or Hobby Shop:
2 2-56 x 1" screws
5 2-56 x 1/4" screws
11 2-56 nuts
5 washers □

PNEUMATIC RETRACTS

from page 88/86

I get some mighty interesting responses from local modelers when they ask me if I got my pneumatic gear from Rhom-Air or Sonic. I merely reply --- "No, I use the ones sold at the drug store for 50¢." Ingenuity triumphs again and one more battle in the war against inflation is won! □

ELECTRIC PUDDLE JUMPER

from page 83/82

(2) Cut out the tray and mount the servo. (Cut to fit your servo.)

(3) Assemble and mount the resistor. Make sure that it lines up with the servo.

(4) Mount the micro switch.

(5) Adjust the micro switch level so it clicks on and off when reaching the center stop of the resistor.

(6) Mount the wiper arm using one 2-56 screw, nut, and washer.

(7) Make secondary adjustments to the switch, servo arm, and the wiper arm so power is off with the servo at neutral.

(8) Take off the resistor switch and servo and cut off the excess mounting material.

(9) Solder 18 gauge wire from the negative side of the battery to the short side of the resistor then to NC (normally closed) terminal on the micro switch.

(10) Solder 18 gauge wire from the positive side of the battery to the long side of the resistor then to NO (normally open) on the micro switch.

(11) Remount the resistor.

(12) Solder positive (+) side of the motor to the wiper arm.

(13) Solder negative (−) side of the motor to common terminal on micro switch.

(14) Make final adjustments to the resistor, wiper, and switch so power is off with servo in neutral.

(15) Install the unit in the Puddle Jumper and have fun.

And that's the way Dave sees it. But there's just a bit more to item 15. You have to install the Astro 02, but that's really no problem. Complete the engine mount, just as it is shown on the kit plans. Then, instead of mounting an .049 on the plastic mount provided, cut a mailing tube in which the Astro 02 will fit so the aft end of the tube is flush with the rear of the motor and the front end allows the propeller clearance to turn. Drill two holes in the plastic mount, insert the wires from the control unit, attach them to the motor, then push the motor into the tube, so the tube will fit against the mount, with the wires coming out the back and the motor free to run. When you're sure that it all fits, remove the motor from the tube, paint the tube the color of your choice and attach it to the motor mount permanently with Super T Hot Stuff. Reinsert the motor with the wires attached through the mount and wedge the motor in place firmly in the tube by stuffing some foam around it as needed.

Your electric Puddle Jumper is ready to go.

SNOW FLI

from page 78

that three 1/4" steel wing joiner rods had broken. They were hardened to a Rockwell 59. A word to the wise: Rockwell 59 hardness will not bend; however, it will shatter. If you must tamper with the temper keep it below 45 or be prepared to pay the consequences. My unsolicited advice for the day.

February 17, 5:30 a.m. I brewed enough coffee to get me through the day. A quick glance at the thermometer tells me that it is an even 0°. The weather report on the news is good. Winds from the West at 14 knots with a high temp in the low 20°. We lucked out as the wind stayed from the west and the temp did get to 20°. The wind was gusting to 20±° which is tolerable.

GDSH has an open invitation (no charge entry) to anyone who comes to fly from Florida or California. They had no free entries. Many competitors from around the country know the name of Chet Tuthill, if not the person. Chet is now a northerner. He moved to Michigan last Fall from the South. He was there with his bijou boots (a pair of rubbers over tennis shoes). I was in pain just looking at his feet and commented that he would never make it to 11:00 A.M. --- he didn't!

There were 51 entrants. By class: 19 in Unlimited and 32 in Standard. Warren Tiahrt did an outstanding job as C.D. with the help of a good turnout of club members. The use of correct FCC license was strictly enforced. Warren showed no favoritism in his enforcement. I witnessed him requiring a friend to turn off his thermal sensor for lack of correct license.

The task was three (3) rounds of 7 minutes with a landing circle. History has led the way with no points earned for landing and staying in the circle. Simply, you keep all of your flight points. If you do not come to rest inside the circle you lose 30 flight points. One chap popped the line and did not land in the circle and was down in 15 seconds. He went into round two with a 15 point deficit!

When the snow had settled (there is no dust in February) the winners were:

Unlimited

1. Dave Corven
2. Chris Corven
3. Jim Bohmer

Standard

1. Ray Hays
2. Erick Podzielinski
3. Dale Martel

Best Performance 2 Meter

Mike Fritz

Launching was done by two (2) six volt winches. A snowmobile was used for line retrieval. However, the wind direction and velocity was such that the chutes fell near the winches. □

GLASS CLOTH COVERING TECHNIQUES

from page 75/73

perfectly, following the compound curves of the fuselage with no wrinkles.

As examples, I covered the fuselage of my Martin Baker 5 with one piece of glass cloth as just described with not one wrinkle and it took me all of about 7 or 8 minutes — beautiful! Same thing for my new Laser 200 F. I also covered the cowl of my Laser with one piece and was even able to "paint" the cloth around the lips and into the whole cowl opening.

I've got to renege here just a bit. On fuselages and cowls, I've found it easier to not overlap the glass cloth at the centerline of the bottom of the fuselage. So, I trim the cloth on each side so it just reaches around the bottom corner of the fuselage, leaving a narrow uncovered strip down the center. After the first coat cures I then go back and lay in a narrow strip of glass cloth. You may find it easier and certainly quicker to just go ahead and overlap with the original one large piece of glass cloth, but I find it gets kind of messy around that bottom center area.

After the second coat of thinned epoxy on everything has properly cured, you are ready to sand. The secret of not wasting lots of time sanding is to use coarse sandpaper for the roughing and to use lots of fresh pieces of sandpaper. I use No. 80 TRI-M-ITE FRE-CUT open coat silicon carbide paper by 3M — silvery colored paper. I sand until most of the shiny spots are gone and then finish up with No. 120 of the same type paper. Some modelers may want to get even a finer surface and finish with No. 150 or 180. But remember, rough with the 80 grit, use fresh paper often and you will find the sanding job not bad at all. I have used paper as coarse as 50 for roughing with good (and fast) results but you will get some deep scratches that may not come out in the finish sanding.

One word of caution; do not sand so much that you sand down into the cloth. My experience has been that the second coat of thinned epoxy does a good job of filling the cloth plus leaving enough resin for sanding to a smooth surface without getting into the cloth.

Since I've discussed using a second coat of epoxy as a filler, this is a good time to talk of another filler that modeling friends of mine use and like. Instead of a second coat of resin, they use K & B primer and some even add micro-balloons to the primer before brushing on. I've tried these techniques but always come back to the epoxy as a filler.

My old modeling and flying buddy, Ted White, instead of using thinned epoxy for the lay down coat, uses K & B Superpoxy clear paint and swears by it as do several other modeling friends. Ted follows the initial coat with one or two more then fills with brushed on K & B primer spiced with micro-balloons. He says his plane looks like its been stuccoed after this application but sands easily and looks great just before painting. Ted likes the Superpoxy paint for laying down the cloth because it dries or cures (or whatever it does) very rapidly and thus he doesn't have to wait for the relatively long cure time of epoxy plus the paint is already thin enough to paint on right out of the can.

As to questions concerning the weight of this covering technique relative to other covering methods, my experience has been it's as light or lighter than any with the probable exception of the plastic covering such as MonoKote, etc. I say probable because I have never covered with the plastic materials.

Now that your model is covered, sanded and ready for painting I might as well discuss my painting technique. There are many paints and techniques and mine is just one — I do not claim it's the best. It's quick, easy and satisfies me.

I like the auto acrylic lacquers. Some worry about it cracking with time. In my experience with the acrylic lacquers applied over a resin **and** cloth base, the lacquer does not crack. Over just resin on wood, with no cloth, it does crack. Anyway, back to the painting. I first shoot the grey acrylic lacquer primer (Ditzler primer 32 DZL-32) and then sand most of it away, to save weight. This primer sands very easily. Now I shoot the color or colors and then an overcoat of Ditzler DCA-468 Hi-Performance clear for a tie down coat and a glossy finish. Acrylic lacquers are fuel resistant but not fuel proof. Raw fuel spilled on an acrylic lacquer finish and allowed to stand will pucker the paint and ruin it; the fuel will not bother the resin-glass foundation at all. Aside from raw fuel spilled on and allowed to stand, I have found the acrylic lacquer finish to be durable and completely usable.

The prime advantage of the auto paints, either lacquer or enamels is the great variety in available colors and shades of colors. Caution: all auto paints are toxic in varying degrees; some are very toxic and all should be used with the appropriate precautions. Also, when using epoxy or polyester resins to cover your model, work in a well-ventilated area.

I get many questions as to where epoxy can be bought in larger containers than is usually available in the hobby stores. If you live in or near a fairly large city, call a business that specializes in plastics. If they don't have epoxy in quarts or gallon sizes, they most likely can order it for you on their next regular order. This is what I did, buying a gallon of Evercoat Everfix epoxy resin which will do at least 12-15 planes. At an average cost of $25.00 per gallon this is only $2.00 for the epoxy for an entire plane — a bargain these days. Sears Roebuck sells epoxy by the quart but only through their mail order catalogue. I have had no experience with Sears epoxy so can't vouch for it but imagine it works fine. Some tests would be in order before applying to your model. Evercoat guarantees a shelf life of only 6 months, however, I've had my gallon for 3 years and it's still working like new.

As to where to buy the lightest glass cloth in continuous lengths (0.6 oz.), that's easy, from me R/C Consultants (Dan Parsons), 11809 Fulmer Dr. N.E., Albuquerque New Mexico 87111. See my ad in RCM listed under R/C Consultants. *(Editor's Note: Sig and K & B have 3/4 oz., slightly heavier than Dan's 6 oz., in 6' lengths. Dan has 5 and 10 yard lengths.)*

Well, that's it on mine and some other modelers' covering techniques using lightweight glass cloth and resin. If you have never tried it, I'm sure your experience and conclusions will be like most first timers — "this is it!"

For you who have used the glass cloth and resin and may have ended up in a mess, try my method; you'll like it. If you have any questions before, during or afterwards, give me a call (my phone number is in my ad) and I'll be happy to help you; evening is the best time to catch me. □

SPORT AEROBATICS

from page 71/70

stopping on heading. The application is done **after** you enter the spin, and it goes without saying that the first try ought to be **high**. If you find yourself in a flat spin (don't worry, you'll know . . . you release the controls and the a/c keeps right on spinning — and the nose might not be above the horizon), add full down elevator, rudder against the spin and **power** to blow the tail up. If the results are still negative, pulse the power to try to "rock" it out. As a last resort, with full power still on, you use full down, **no rudder** and aileron **with** the spin. Here you're trying to achieve a spiral dive from which you may recover. Needless to say, all of these things take time (altitude) so experiments **gotta** be begun high. If all else fails, and you can see that you are "going in," cut the power and hold what you've got. The plane, in a flat spin, is falling so slowly that you would be surprised how little damage it will sustain. Don "Lucky" McCullough had a flat spin the other day which ended on the sloping bank at the north of the field. The combination of the long grass and the slope acted like an arrestor, and the plane came through completely undamaged! We should all be so lucky!

So to the diagrams; the transmitter symbols are for Mode II. Good luck and good flying.

Next article; **Slow rolls** and other such crimes. □

EAGLET 50

from page 69

Sullivan 4 ounce fuel tank, Aero Trend fuel line, Fox filter, 8 x 6 Master Airscrew prop and a Goldberg 2" spinner completed the engine installation. We would recommend an engine in the .15 range for beginners. The .20 will climb the Eaglet straight up at full throttle.

Radio:

There is enough room in the radio compartment to install almost any of the radios on the market today. We used a Futaba FP4FN with S-18 servos. The servos were installed on the Futaba tray and then bolted to rails as far back in the radio compartment as we could get them. The receiver and battery were wrapped in foam and located forward of the servo tray. Goldberg pushrod connectors completed the linkage hook-up.

Flying:

The building was fun but the flying was the best part. The Eaglet balanced on the money without any ballast required. With the control travels set as recommended in the instructions, we were ready for the first flight. Half throttle was used for the first take-off and the Eaglet made a nice straight take-off run and a smooth climb out. The only trim required after the first flight was two turns of down elevator. For the remaining flights, we used a Futaba trainer cord so the builder could get some flying time. The Eaglet is a fun plane to fly and displays the forgiving nature required of a good trainer, when the throttle is kept below 50%. At full throttle, the Eaglet will show you its sporty side. The landing speed is very slow due to the light wing loading, and spot landings are easy to perform with a little practice.

Conclusion:

The Eaglet makes a great basic trainer when set up as a three channel

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EAGLET 50

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airplane, but would be a super fun fly model if you used the optional ailerons. The Eaglet is an easy kit to build and when you add the flight performance, it becomes a very good buy.

The week before we flew our Eaglet, another Eaglet bit the dust, at the local flying field, due to wing failure. To determine if it was caused by a faulty glue joint, or weak spars, we tried to break a wing by diving from altitude with full throttle set and then pull out as hard as we could without pulling the throttle back. Our wing is still in one piece, and we feel that if you follow the instructions to the letter, your's will stay that way also.

We strongly advise to re-glue the spar doublers to the spars and when the webs are installed in the wing, go back and re-glue each of them. There has been two additional webs provided that do not show on the plans or booklet. They go in the sixth bay from the tip. This leaves only three bays without shear webs.

Good flying! □

THE FINISHING TOUCH

from page 68

can be thinned up to 20%. Sand your cured SG with #120, or #150, and finish off with #320 Fre Cut. You can go this far in your finishing schedule while the tail parts are still separate, and the wing halves apart. The advantage of doing this is to be able to do as much sanding as possible of parts placed flat on your workbench. I do not recommend using Softglas directly on balsa. It soaks in too much, which adds weight, and is not as strong as polyester resin.

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Primer #2:

After your Softglas has been sanded to #320 grade, spray the whole surface with DuPont 100S Multipurpose Primer. Begin your sanding of this coat with #150, go to #220, and finish again with #320 Fre Cut. Correct any remaining defects with 3M spot putty. Re-prime these spots with 100S if necessary, and sand to #320. Remember, it is not how many coats of primer you put on, but rather, how many you sand off. Now before putting on your final color topcoat, as an **option** you may wet sand the primed surface with #400 Wet or Dry sandpaper.

A quick closing word about "primers." We are really referring to the auto finishing type, and these are primer-**surfacers.** They are very thick paints requiring larger orifice spray guns for proper application. The surfacer part is a "filler" that fills in microscopic defects. You must strive to sand off most of this material to avoid weight build-up. Space here does not permit the discussion of sealers, but that is not necessary if you use DuPont 100S Multipurpose Primer. DuPont Sealer (2129S) is desireable to use over 30S or 80S primer-surfacer to prevent solvent in your color topcoats from causing "swelling" of sanding scratches in previous steps. Spray cans of auto primer are very low in surfacer content because the orifice size is too small and pressures too low compared to professional spray equipment. Therefore spray cans of primer should only be used as a last resort or for minor touch-up. I have had good success with a primer by Plasticote sold at K-Mart.

Another Option:

(1) Skip the auto-surfacer primer step and sand your resin surface to #320 grade. (2) Go to K & B Superpoxy Primer as a substitute for the Softglas and 100S primer. K & B does not fill as well or sand as easily, but smaller orifice guns can be used. **Special note:** K & B primer is very susceptible to "fish eyeing." Clean all surfaces thoroughly with thinner. (3) A third choice: skip the resin, the Softglas and the 100S, and spray K & B Superpoxy Primer directly onto the sanded blasa. Use this method only on small surface planes such as 1/2A.

Spray Guns:

Forget about all the "hobby" type air brushes. They are good only on HO trains and plastic model airplanes.

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They are totally inadequate for the typical .25-.60 R/C planes, using the modern materials discussed in this article, and Part I. Their fluid orifices are far too small, and their fan pattern too narrow. They should not even be advertised in R/C catalogues and magazines. That leaves us with four choices of professional touch-up detail guns. I will list them in order of descending price:

DeVilbiss EGA-502 with a #395 aircap and needle assembly — ($130). It will accommodate all of the primers and paints described in these articles. Has four other smaller aircap and needle assemblies available.

Binks Model 15 — ($120). Comparable to DeVilbiss EGA-502, but only has three aircap and needle size options. Get the largest — #78.

PaascheBUF-4 with a BF4 aircap, tip, and needle. (About $100 with two material cups.) The advantage of this gun is that it can use an 8 oz. siphon feed cup, or a 3 oz. gravity feed cup. The 3 oz. gravity food cup is great for small quantities of paint, easy cleaning and instant trigger response. I have a slightly smaller model, the AUF-3, but it is inadequate for thicker primers.

Badger 400-2 Detail Gun. (Tower sale price has been $65). Has three tip sizes — get the largest. I have never used this gun, but it looks very similar to my DeVilbiss.

I have used the first three guns listed above, and can attest to their capabilities. All four should have patterns adjustable from a small round pattern, to a wide fan pattern. My suggestion — consider the Paasche or the Badger.

Air Compressors:

Get the biggest, no frills, piston type you can afford. Don't waste your money on diaphram type compressors. Three-quarter horsepower is minimum, and 1 H.P. is desirable. Forget about fancy control panels and air dryers. A dryer installed at the compressor is ineffective — the air is too hot there. The best air dryer is a 20' length of coiled copper tubing attached to the output of the compressor, with the hose attached to the top of the tubing helical coil. This arrangement allows the water vapor in the **hot moist compressed air to cool and condense,** so the water will flow back into the air supply reservoir tank. Otherwise the water will condense farther downstream in the cooler part of the air hose, and cause water spitting out of the gun.

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THE FINISHING TOUCH

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As you can see, everything covered in this two part article is its own complex subject, and I only have hit the highlights. Above all, keep in mind that your first attempts won't be perfect with any technique. The final result is a product of your patience, proper equipment, and experienced hard work. ☐

PIT STOP

from page 67/66

about this and he said they wanted to get as much competition running time on the car as possible, and where could you find a better place than this 24 hour race? Makes sense. The car itself was quite interesting. The P.B. and Associated IS cars use a combination gear and chain drive which has proven to be quite reliable and the cars are certainly quite fast. Delta decided to eliminate the chain by mounting the engine in an anglewinder method, similar to what is now used in slot

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cars. The front end uses a single swing arm on each side, rather than the conventional double "A" arms. This is a much lower assembly, probably aimed at being able to use a much lower frontal area body. The car seemed very smooth and stable on the track, somewhat similar to the other IS car, the P.B.

Saturday morning was a beautiful day. Everybody ran their cars a few more times before the noon starting time. A couple minutes before noon, all the cars were placed on the starting line with the motors off. At noon the starter raised the flag, the pit men grabbed their cars and ran to their pits to start their cars. Within 10 seconds, Ralphie Burch, Jr. was on the track. Two seconds later, World Champion Arturo Carbonell was racing, and soon all the cars were on the track. Ralphie and Art looked like they were on a qualifying run. Ralphie had about a 20 foot lead, opened it up to a 50 foot lead and then hit a dot. Art closed in, but then Ralphie would start to pull away again. This happened three times. Finally Ralphie got used to the car and opened up about a 1/3 of a lap lead. But then at 6½ minutes Ralphie ran out of fuel. Art took the lead and held it for the end of the first hour, turning their best time of 175 laps. Curtis made a couple of extra pit stops to dial the car in. When he felt he could drive it for 24 hours, he started cruising. Cruising brought him in 2nd at the end of the 1st hour with 170 laps.

At the end of the 2nd hour, USA National Champion, Rick Davis had turned 177 laps to put Associated Team #1 into first place. Rick made it look so easy. Jianas took over the 3rd hour, and even in spite of having a terrible cold and sore throat, Bill

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opened up the lead farther. These guys were on Cruise Control and still going fast. They were averaging over an hour on a set of tires, while other teams were leaned out to the max, with the pedal to the metal, and wearing out their tires in 30 minutes. But Curtis, Rick and Bill all had enough experience to know that this race isn't won in the beginning, it's won at the end. They were patient, took their time passing, and were still pulling away from everyone else.

About the 4th hour they had built up about a 45 lap lead over the Delta Team #3, who were now in 2nd place. With that much lead, I thought it was my turn to drive, so I asked. What the heck, they couldn't say no, because they had to have a 4th driver. Curtis just finished his 1/2 hour session, and as the car was being fueled by Bill Newlin, Curtis handed me the transmitter and said, "There are no brakes. Don't complain. Just drive." Immediately, I thought, "Oh, my God! The car must be terrible!" I started driving, and sure enough, the brakes weren't very good, the engine was super rich, the car had a slight amount of understeer. The way it was, it would have been a terrible qualifying car, but it was a perfect 24 hour car.

I again thought of what Curtis had said. He had seen these other teams leaning their motors down trying to catch up. Sure their cars appeared to be going fast for a little while, then as the drivers became more and more tired, more and more crashes happened. He was trying to tell me, just drive the car — you'll like it. He was right. To me, I felt like I was just cruising, but we were getting farther and farther in the lead. I was

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wondering, if the other teams are having driving problems now, what are they going to do at night. There were lights on this track in the Tropical Park parking lot, but they were just adequate — no more. I finished my 1/2 hour driving, even gained some more laps for the team, didn't hurt the car and I could see the feeling of relief on their faces as Rick took over.

I didn't drive at night. I didn't want to press my luck. The rest of the team was probably thinking — thank goodness. At 8:00 the team had a 55 lap margin over the #3 Delta Team. Joe Tassillo III, Ray Hepner and the rest of these guys were doing a super job. They were ahead of their last year's times and doing great. The other Delta Team with the prototype IS car were having all kinds of little problems, which was to be expected, but then that's why they ran the car, to learn these things. Sometimes the car looked good and other times it was obvious something was wrong.

A little after 8:00, the Associated #1 car lost a steering servo. The first thing to go wrong. It took Rick Davis about four minutes to change the radio tray. They only lost about 12 laps. Their normal pit stops took an average of one minute and fifteen seconds. This included changing all four tires, car battery pack, cleaning body and refueling. Their pit stops were so fast, the other teams were coming over to watch to see how it should be done. Rick would remove the left rear wheel, slip the complete axle assembly out and reinstall the replacement. Bill would change the left front tire, Curtis the right front tire and then the battery pack. Super team work.

Meanwhile the Associated Team #5 was having all kinds of steering servo problems. They ended up using 13 steering servos! And they were using the exact same servos as the other Associated team. Something was wrong, but they couldn't figure out what it was.

The Puerto Rico Team #4 used about six motors, but they never gave up. They just leaned them down and went racing.

The #6 P.B. Team had a million problems, and finally ran out of parts about midnight.

About 11:00 p.m. I decided to go to the hotel and sleep. I asked Arturo if he was coming along, because last year he was driving 1½ hour segments, and by nighttime he was dead, so he had gone to the hotel to

sleep, too. He said, "The whole team may be joining you." I asked, "What do you mean?" And he said they were running out of gears, and they only had six more to go. They must have shifted into cruise control after that, because they lasted, so I guess Art never got any sleep.

I returned about 7:00 in the morning, and believe it or not, the team was really happy to see me. I said, "How are you doing?" They said, "Great, we're about 400 laps ahead." Then they threw the transmitter at me and went to sleep in the motor home. I guess they felt with a 400 lap lead, it was safe to let me drive. You know, the car actually felt better this time. I think the tires were fresher. I drove about 45 minutes until I got tired, then Rick took over. At the end of the next hour, which was mostly Rick's driving, we turned 180 laps. I felt pretty good.

Our other #5 Team had set a record of 183 laps for one hour with Ralphie Burch and Chuck Phelps driving. This was at 2:00 in the morning, yet. Not to be outdone, the #1 Team followed it up with an identical total of 183 at 5:00 in the morning with Curtis and Jianas driving. I don't know how they saw their cars.

Five cars were still running. The #1 Associated Team was 400 laps ahead and growing. The #3 Delta Team was in a solid 2nd place, well-ahead of last year's pace, and still running strong. The #2 Delta Team and the #5 Associated Team were racing each other all through the night. They had almost identical laps. They both spent so much time in the pits, their race was mainly to see who could stay on the track the longest. Finally the #5 Associated Team took over 3rd place.

Along about 9 a.m., Bill Newlin told the guys they had a great chance to break 4,000 laps, which was thought to be impossible. This seemed to breathe some new life in the guys. I drove a couple more times. The car was the same as before. About 11:40 a.m., they passed the 4,000 lap mark and then they asked Roger Curtis to finish the driving. Roger had felt he didn't want to drive, but they insisted. Roger came down the straightaway and ran right into the boards at the end of the straight. I thought, oh, oh. Somebody forgot to tell Roger about the car. But in a couple laps Roger had the car figured out and he was jetting along. As a matter of fact, the last hour's total, with Curtis Husting and Roger Curtis driving, was 176 laps, which was better than all the other cars, except #5.

The team beat their last year's winning total of 3649 laps by 419 laps, finishing with 4060 laps. This was

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equal to beating last year timewise by 2 hours and 45 minutes! I know records are made to be broken, but this is one record that's really going to be tough to beat. Consider this — the car was as fast as any car on the track. They only lost four minutes changing one servo. They had no other problems. The Rich Lee built K & B 3.5 ran 24 hours. No problems. It used the same glow plug 24 hours. They did change the air filter **nothing else**! It's going to be tough to whittle away at that 4 minutes. One other point. At 9:21 a.m. they were far enough ahead, they could have stopped racing and still had enough laps to win.

Miami TV station gave coverage of the race on TV.

It's midnight, we're tired, we're out of parts, out of the race, it's cold. Let's burn the car body and get warm.

Bill Newlin, on the left, is checking for loose screws, as Davis changes rear tires. Bill Jlanas and Curtis Husting have finished changing front tires and are now changing the battery pack. Complete pit stop takes 1 minute and 15 seconds — including cleaning body!

The #3 Delta Team finished 2nd, breaking their last year's record and I'm sure they'll better that next year.

The #5 Associated Team had the speed, had the drivers and the potential to make this an interesting race. But Lady Luck deserted them.

The #2 Delta Team was obviously the toughtest team there, choosing to fight that 1,000,000 to 1 odds. And they did finish 24 hours.

The #4 Puerto Rico Team has the spirit and enthusiasm to be able to do better next year, together with this year's experience.

There's no question the #6 P.B. Team deserves the tough luck award. They never quit trying, until they ran out of parts.

There is another award that should be given out, and that's a Most Improved Award. It's not for a car or team, but to the host Southern Florida R/C Car Club. Last year there was a big problem with lap counting, which

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fortunately got straightened out in time. This year the club brought in Sim Picheloup from Dallas, Texas, to run the lap counting procedures. Did you ever try counting laps for 24 hours? Sim made it look easy and proficient. Lap totals were posted every 15 minutes, and I never heard one lap counting complaint. On top of that, Sim sent me a complete minute by minute computer printout of the whole race. Just beautiful, Sim.

Congratulations to all you racers. You're unreal! ☐

J-3 CUB

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The tail surfaces are built up from 1/4" x 1/4" and 1/4" x 1/2" balsa with die-cut balsa leading edges for the horizontal stab and die-cut trailing edges for elevators. This all went together fast, using Goldberg Super Jet, with the only delay being caused by the poor die-cutting. The stabs were joined to the fuselage using Devcon 5-Minute epoxy. After everything was glued or bolted together for the final sanding we came to realize just how good a J-3 Cub looks.

Covering:

To keep the J-3 looking like it should, it was covered with Top Flite FabriKote. The fabric adds to the strength and appearance of the model. After the final sanding, the covering job was started. No problems with the way FabriKote goes around compound curves, and the way it will shrink. The one thing we found was the way it

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refused to stick to itself, which required a lot of Jet along the seams. The wing struts were fiberglassed using K & B products, and then painted. Both the struts and landing gear were painted with K & B yellow with flat catalyst. The K & B yellow is a very close match to the FabriKote. After everything was dry, the windows and windshield were installed, using Goldberg Super Jet. The self adhesive mylar decals completed the package.

Engine:

An O.S. Max .40 R/C was bolted to the engine mount provided in the kit, and then installed inverted on the firewall. The cowl that is included in the kit allows enough room for almost any engine installation. A Semco muffler was used to keep the noise down and the airplane clean. A 6 ounce Sullivan fuel tank and Aerotrend fuel line completed the assembly.

Radio:

A Futaba FP4FN radio, using S-23 servos was installed. The servo tray and receiver were mounted in the center of the cabin and the battery forward next to the fuel tank. The cabin area is very large and almost any radio could be installed in this model. The pushrods, linkage and clevisis provided in the hardware package were used to complete the radio installation.

Flying:

With the control travels set as recommended in the instructions, and the C.G. checked (no ballast required), the Cub was ready for the first flight. The first take-off was at partial throttle and the Cub lifted its tail and went straight down the runway. The climb out with full throttle set, was brisk and the altitude gain was rapid. In flight, the Cub displays all of the flight characteristics that made it so popular as a full scale aircraft. When the throttle is set below 50%, the Cub is a lazy flier, but when you push the throttle forward, it will move out at a surprising speed. Aileron rolls are very smooth and loops can be any size you want to make them. Everybody who flew the Cub was very impressed with the performance. The experience of these pilots ranged from twenty years in R/C to one day. The landing speed is very slow and this Cub will side slip just like the big one. Any regular .40 will provide more than enough power.

Conclusion:

Writing the conclusion seems to be

the hardest part of this project because there was a lot to like about this kit, but some parts were not supplied or did not display the same overall quality as the rest of the kit. The engineering was first rate, but the die-cutting caused problems during construction. The hardware kit was very complete, but did not include any scale engine cylinder assemblies, and the scale documentation included in the kit was a small 3-view line drawing. On the positive side was well-drawn plans, and except for one major error, an excellent instruction book. The removable wing panels allow for easy transportation of a large scale model, and the flight performance is close to fantastic.

Any builder who has built a few kits could build the J-3 by following the plans and instructions. The Cub could be used as a trainer, by using a buddy box, but the Sunday flier will have the most fun with it. The J-3 is a real blast to fly and coupled with the appearance, should be a model that you won't get tired of. □

GEMINI MTS

from page 62/56

using appropriate size dowels wrapped with sandpaper. When the fit is correct, tack epoxy the tubes in place.

Step 2. Next, select a firm piece of 1/8" x 1/4" balsa, cut to 10⅞" in length and taper to 1/8" on one end.

Step 3. Epoxy the 1/8" square spruce to top and bottom allowing 1-7/16" overhang at the root end. Make two spars.

Step 4. Commercial 1/2" x 1/8" trailing edge stock is cut with the 1/8" side square with one of the surfaces. Use a light cut with a razor plane or a long sanding block to trim the edge so that it is square with an imaginary chordwise centerline.

Step 5. Now make up your shim pieces and pin to plans. Note that the trailing edge shims are angled on the top surface to support the trailing edge such that the trailing edge centerline is parallel with the workboard. Cut the tube assembly apart and to length. Slip the inner tube and wire in place then slide the tube assembly into the spars and pin to plans over the shims. Do not pin through spars. Do the same for the leading and trailing edges.

Step 6. From 1/2" wide stock, cut the ribs to length and glue in place. Note that the root ribs are 3/16" thick, the first rib outboard of the root and the tip ribs are of 1/8", and the rest of medium 1/16".

Step 7. When the glue has dried,

remove from board. Check that the horn still fits properly.

Step 8. Now add all the gussets and fillers as well as the 1/8" x 1/2" firm balsa supports that go up against the tubes.

Step 9. Go over all glue joints with a slightly thinned coat of glue and over the tubes and tube assembly attachment area with epoxy.

Step 10. When dry, carefully razor plane and sand the stab to the streamlined shape shown. Sight from both ends as you go as well as using a straightedge to be sure that you have a smooth progressive taper. Add the 3/8" thick soft balsa tips and contour to match rib shape. Round off the tips. Add 1/8" balsa pieces at the root — leading edge area and sand to match rib contour.

Step 11. Go over entire stab with 400 grit paper.

Fin & Rudder Assembly:

Step 1. Cut out the two 1/16" ply tube supports.

Step 2. Locate and drill the 3/16" diameter and the three 3/32" diameter holes. Do this with both pieces held together on the bench.

Step 3. Glue the three frame pieces to one of the ply sides.

Step 4. Apply glue to the face of the frame pieces and place the other piece on top. Before the glue sets up, insert the 3/16" diameter brass tube into both pieces and, using a square, check that the tube is perpendicular to the plywood top piece. Do this at a number of different radial positions around the tube. If necessary, slide the top plywood as required to properly align the tube.

Step 5. When dry, block sand the edges square and straight.

Step 6. Place on plans and construct the fin around it.

Step 7. Build up the rudder.

Step 8. When dry, remove from plans. Bevel forward edge of the rudder as shown if you plan to use a tape hinge.

Step 9. Sand edges round and go over entire fin and rudder with fine sandpaper. Do not cover fin at this time as the fin will have fiberglass applied up to the top of the plywood pieces after assembly to the fuselage.

Covering & Finishing:

At this point all of the construction should be completed and the model ready for covering and finishing. If you have fiberglassed the fuselage you should mask off the portion of the fin above the plywood, and apply two coats of K & B primer. After sanding smooth, one or two coats of K & B or Hobbypoxy should result in a slick looking fuselage.

The remainder of the model is covered with MonoKote. I would advise against using any of the low

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heat plastics or any woven covering material on parts of the model that have open structure such as wings or tail surfaces.

Pin the rudder to the fin with the rudder defected such that the face of the beveled edge of the rudder is against the aft face of the tail post. Apply a strip of 3/4 Magic mending tape full length. Unpin and deflect fully opposite and apply three pieces crosswise, top, bottom, and middle.

After covering, install the radio gear, etc., and adjust for centering and throw. The elevator should be rigged so that the leading edge is about 1-1/16" above the top of the fuselage.

Strap the wing on with a few rubberbands and check balance. The model should balance approximately 3/8" aft of the spar. Add nose weight as required. Inspect the wing carefully for warps. The main panels should be straight and the tip panels should have some washout. Anywhere from 1/8" to 1/4" is okay but they both should be the same. Let us hope that at this stage you do not have to unwarp a wing panel. It is not easy to do. Slight warps can be reduced or removed using a hot heat gun and two pairs of hands, or one pair of hands twisting the surface while passing it back and forth in a jet of stream from a tea kettle.

Flying:

The Gemini MTS does not fly much differently than other thermal sailplanes so the procedure of hand glide, nose weight and trim adjust is the same as you have done before. This also applies to the initial winch or high start launches. Where the Gemini launch procedure differs from others is that while it launches well on 6 volts, it does better on 12 volts, and preferably with a zoom release. Here it is just a matter of your practicing using a 12 volt winch and learning how to get the most from a zoom launch.

In essence, you pre-load in the usual fashion before release and stay on the button all the way — about 3/4 of the way up if you have been holding any back stick, you ease off or apply a little down to level off. When the model passes over the turnaround and starts down, you get off the winch button and give the stick a jab of up. Try to fly, after release, at a climb angle of 45°. You should practice with the ship empty, also with various amounts of ballast and in both calm and windy conditions. □

from page 54/51

of mail, I have at least 50 letters here on my desk which have not be answered. I regret to have to tell you that it has gotten to be a real burden and I am finding that it is not possible for me to answer them all; it's an impossible situation and the volume of mail coming in makes it even worse. While I truly regret not being able to reply to you all, it's just not possible any longer. I'll still do the best I can, but if there is a question you have, let me have your phone number and I'll call you collect as soon as I have an answer for you. Naturally, such calls will be made at the most favorable times as far as phone rates are concerned or at a time you specify.

Please don't take this as meaning I don't want to hear from you. I appreciate your letters and the photos you have sent to me in the past and I hope you'll continue to write. It's just I can't possibly answer all the letters that arrive here. (My postman is already complaining of a hernia, and I've only been here seven months!) The stack of mail here will eventually be answered, but it's going to take a lot if time; please be patient, I'm going as fast as both of these fingers will allow!

A couple of quick additions which came up recently. The Canadian Nats will be held in Edmonton, Alberta, in July of this year; there will be a Giant Scale Rally at Bawlf, Alberta, July 1-5 and a Fun Fly type Rally near the end of July. If you have ever planned a trip to Canada, this has to be the right year and July has to be the right month.

If you have ever wanted to take the family on a trip to, or through, the Canadian Rockies, you couldn't find a better time to do so. Banff and Lake Louise, Jasper, and our National Parks are geared up to serve you at that time of year. Gas is less costly here in Alberta than anywhere else in Canada (30.9¢ per liter self serve as this is written). We automatically give you a 15% premium on your dollar when you come to Canada, so $100 U.S. is $115 here and shopping for the ladies is in good supply with many major malls open for business.

As this is written (December) the three events are in the planning stages and I'll have more to report to you as this planning progresses and the events take shape. Be assured of a warm and hearty welcome when you do visit us, we like company and we'll make you feel at home.

Next month we'll take a look at fuselage construction for the larger engined models and other good things. □

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..... part had to be re-drilled for 5/32" wire and an aluminum pivot tube was used. Most of the rest of the kit is standard and no construction difficulties were encountered.

Engine:

We felt, because of the weight of this plane, it wouldn't hurt to use the top recommended engine, a K & B .40 was used. As a result, we replaced the 6 oz. tank included with the kit with a Sullivan 8 oz. slant top tank. There is more than enough room in the tank compartment for this larger tank and still include the 500 mil. battery.

Radio:

The RCM Hi-Boy 4 prototype was flown with a Kraft radio using 4 KPS-12 servos. The radio compartment also is very large and your gear will fit comfortably. Even though there is a cutout in the servo tray, they recommend you use your servo tray and fit the whole tray over the cutout. In the forward end of the compartment there is another cutout for your receiver. Thus, all the wiring is underneath giving a clean uncluttered look to the radio compartment.

Covering:

The RCM prototype was covered with white and red Super MonoKote and the black striping was made from trim MonoKote. We applied JET cyanoacrylate adhesive to the edges of the striping which keeps it from getting gummy due to fuel penetration. The kit also contained the cabin windows and a number of colorful stick-on decals.

Flying:

The flying characteristics of the Hi-Boy 4 were definitely up to our expectations, smooth and very stable. There was very little tendency to float upon landing, we found it necessary to fly it right to the ground. There are two locations mentioned in the construction sheet for placement of the landing gear. The forward one if you want it to be a tail dragger, the aft one for trike gear. Initially, we installed the landing gear in the aft position, but because of the extreme distance between the nose wheel and the main gear, the plane had a tendency to fall into that space when taxiing or on take-off. After we moved the main gear forward to 1½" behind the Center of Gravity she became very stable on the ground and rotated with

no problem. We were very satisified that we had installed a .40 engine in the nose, not only did it give added zip but the weight of the extra fuel, the larger engine, and muffler seemed to add stability to the flying characteristics.

Conclusion:

We wouldn't hesitate for a moment to take a full swing at a hardball with the completed fuselage, it is strong and very tough. The obechi wood covered wing is the outstanding feature of the whole kit. A minimum of sanding, installation of the included aileron horn and hinges gives you a beautiful **strong** wing. Since we upgraded the engine to a .40 we felt that a steerable nose wheel was a necessity for ground handling which was added, thus making this an outstanding sport plane.

The one and only complaint we had with the kit was the hardware, particularly the nylon pushrod connectors and plastic clevises. We were assured by Hobby Lobby that these were standard modeler accessories in England. The keeper for the connector, once installed, is there permanently, do not attempt to remove it, it will cut through the nib. The standard English practice is to force the clevises on the end of the pushrods and cement them there with a cyanoacrylate adhesive. From what we can see, it should hold for the life of the plane. Adjustments are made at the servo end of the pushrod. □

SOARING

from page 47/46

serious 2-Meter development. They are a very small minority. A few manufacturers are pushing the performance envelope and some of the results (Dave Johnson and the K-Minnow) are awesome, but the kit buyers are saying, "Forty (or forty-five, or fifty, or seventy, or one hundred fifty) bucks just for a 2-Meter? You are nuts! I'll keep flying my RO-Gentle Drifter/Arrow X2. It flies well enough for my purposes." I can't help but conclude that a strictly 2-Meter contest is playing to a limited audience, and all I can hope to do is get a decent response and accept the idea that I will never see a 2-Meter contest with more than thirty entries. I can't imagine anyone driving 150 miles and staying overnight for 'just a 2-Meter contest.' One day; same old tasks; low key; give them what they want, not what they need. Am I beating my head against a stone wall?

JB

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SOARING

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Jim is right, I don't think any area of the U.S. can attract more than about thirty or so fliers to a strictly 2-Meter contest; with the single exception of the 2-Meter World Cup. Sales figures are not easy to come by, but I think the big volume in kit sales is in the smaller (and cheaper) sailplane. Many beginners will start with a small ship but graduate to a larger one as skill and pocketbook increase. Thousands of fun fliers who don't care about contests participation fly the small ones for low cost and convenience.

Perhaps one thing Jim has missed is that aside from the entry fee income, and pride of the Contest Director, a small contest is a heck of a lot more fun than a big one. A case in point is an annual all 2-Meter contest put on by the Soaring Union of Los Angeles, CD'd by Rick Norwood. This is a two day affair with fliers coming from within a 150 mile radius — but not many. In 1980, only 25 showed up. However, these 25 had such a good time, entries were limited to 30 in 1981. Only 27 came --- this in the Los Angeles area where the monthly contest run by the area soaring clubs draws 80 to 90. The attraction in this small contest is the number of rounds flown. In 1980, 16 rounds were completed in the two days. In 1981, 15 were flown. The premium was on consistancy. If you blew one landing, you weren't out of the contest. The tasks were two 2-minute precision and four 7-minute duration, repeated until the Sunday cut-off time of 3 p.m. Saturday cut-off was 4 p.m. Rounds in progress at these times were completed. The 7 minute task was flown man-on-man. Everyone was

either flying or timing, and having a ball. It may or may not be significant, but four of the top five finishers were high performance sailplanes. The top two were Sagitta 600s, 3rd was a ship designed for the World Cup, and 5th was a K-Minnow, with ailerons and flaps.

It is significant that probably not more than three of the 27 entrants in this 2-Meter contest will enter the 2-Meter World Cup Event. And, if speed had been added, none of the World Cup fliers would have been attracted to it, but many of those who did enter would have fled. The 2-Meter World Cup is a multi-task event, with speed, distance, and duration rounds. It is very much like the international F3B type competition but with some significant changes to improve the logistics and challenge. This contest attracts two types of fliers; those who love to fly in speed and multi-task events; and those who like the design challenge of multi-task events; and combinations of both. The event took three years to develop. The first year brought out a herd of floaters. A strong wind and attempts to load up with lead resulted in a destruction derby, but showed what needed to be done. The second year brought out more specialized ships and was pointing in the right direction. At this writing the third contest has not yet taken place, but I know of many ships being developed just for this one.

So you pays your money and takes your choice. Everyone can't like the same thing. If you like the big ones, fine; if 2-Meter is your thing, go for it. At least you will be in a small exclusive group.

★

A while ago I received a sample of a new covering material from Coverite. it's called Micafilm. I haven't had anything to try it on as a covering, so all I can do is report on my observations. It looks virtually indestructible. It resists poking with sharp objects (such as weeds and bushes). If you start a cut with scissors and try to tear it, it's tough. It looks like a good covering for a small airplane as it is quite a bit lighter than other film coverings. This is principally due to the fact that there is no adhesive on it. So, how do you stick it down? You brush on Balsarite, let it dry a few minutes, and iron on the Micafilm. Seams are made the same way, by brushing on Balsarite in the seam area. It looks interesting if it will shrink well, stay shrunk, and stay stuck. I'll try it and let you know — I'm pretty fussy regarding coverings. Looks like you could save half an ounce on a 2-Meter wing. Not too much, but if the other advantages also materialize, it would be worthwhile.

Howzat! □

GIVE IT A WHIRL

from page 45

1982. The "International Modeler's Show" in Pasadena, California, which was held early in January, was well-stocked with R/C helicopter booths, and demonstration flying of R/C helicopters was conducted twice a day for the two days of the show. From the activity at this show it confirms the view that interest in R/C helicopters by the "average guy" is really increasing fast. It also showed that the newcomer to our sport is often "turned on" enough to try the R/C helicopter after attending a trade show and seeing them "in the flesh." So let's talk about some of these shows.

A new show is starting up this year — the "Northwest Modeler's Show" held in Pullyup, Washington, on February 6th and 7th. This show is intended to provide information and incentive for the modelers in the northwest of our country. I'm going to try and get to this show and, if I do, I'll tell you about it.

Then, of course, there is the now famous "WRAM" show, held in White Plains, New York, on February 20 and 21. This is the major trade show for the east of the country. Weather, of course, is a factor at the time of the year these shows are held. They are always well-attended, though.

Then, early in February, is one of the greatest trade shows in the world, held in Nurnberg, Germany. Helicopter activity at this show is always very vigorous. Another trade show is held in Osaka, Japan, during April and, of course, the Tokyo, Japan show is held in October. Both of these shows feature many, many R/C helicopters by Japanese manufacturers.

Coming back closer to home, the next major trade show is the "Model and Crafts" (MAC's) show which is held in Long Beach, California, on the 24th and 25th of April this year. The 'MACS' show has, in the past, had the most outdoor helicopter flying of all the shows so you helicopter 'nuts' should try and attend this one. (I hope that we can fly this year — now that our flying site there is being built on!)

Finally, of course, we have our greatest American trade show, conducted by the "Weak Signals R/C Club" in Toledo, Ohio. This show will take place on April 2nd, 3rd, and 4th this year. The 'Toledo' show has to be seen to be believed and if you are interested in R/C helicopters, just **everyone** will be there. However, usually with the weather as it is in

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GIVE IT A WHIRL

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April and the location of the show being in the city, flying demos are very limited and sometimes do not occur at all. So for those of you interested in R/C helicopters there are a number of trade shows you can attend and, I'm sure, many, many, smaller meetings and shows in your own area. So ask your local club or hobby shop when and where they are. I'll try to publish more on these in future columns.

Last month I tried to explain some of the "mechanics" which were involved in making a helicopter hover because many beginners seem to have problems of knowing **what** to do, rather than **how** to do it. It seems that once they could keep the 'beast' in one place they began to learn fast. I now find, however, that many beginners are having problems **prior** to lift-off and are confused by some of the reactions the helicopter feed back to them while the skids are still on the ground. A better understanding of the control mechanism of the various helicopter heads should be helpful in this regard since a helicopter "don't work too well while still on the ground" and there's a good reason for this, too. So next month I'll attempt to throw light on this facet of learning.

Maybe we'll see you at some of the trade shows or meets this year?

'Til next month. □

GIANT SCALE FLOATS

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27. If 1/64" ply was not used as veneer, fiberglass floats at this time, using 3/4 oz. cloth, complete with filler and paint.

28. Make rudder 2" x 4" from 3/32" ply and attach as shown with 3/8 #2 S.M. screws, using a 1/16" ply spacer.

29. Rig water rudder using 20# cable and #3 sleeves crimped on, to 1/16" ply "tiller" screwed on to bottom of air rudder as shown. Use small soft springs or elastics as shocks to avoid sudden loads on rudder servo.

HINTS ON WATER FLYING

Waterproofing Receiver:

Just a drop of water, either from spray entering the compartment or by condensation, can short out your receiver or servos and cause a crash! So use waterproof servos, and waterproof your receiver as follows: Make a "spool" from lite ply laminated to 1/2" as shown on the plan. All the servo leads go through the 11/16" diameter hole, the split 11/16" diameter spool with a 1/4" hole goes over the leads and this is carefully sealed in place with GE silicone rubber; careful applications of silicone are made to be sure the leads are sealed in the 1/4" hole. Let cure overnight. Put the receiver in a tough clear plastic bag, along with a small quantity (say 1/2 oz.) of dessicant crystals (blue when they're dry) in a "bag" made of cheesecloth or fiberglass screen. The spool goes in the plastic bag opening and is held securely with a heavy elastic. (Have an extra elastic in place in case one breaks, later.)

The antenna can have a separate opening, to reduce the possibility of interference, also sealed using a small spool with a slot, as shown. After each water flying session the dessicant crystals can be visually checked to be sure they're still blue --- a guarantee there is **no** water present! If the crystals turn pink, remove them and dry for a couple of hours at low heat in the oven, reinstall. If they turn pink again quickly, there is likely water present, so remove and dry the receiver carefully. The system should keep all water out even if you "dunk" the aircraft, and saves a lot of trouble.

Water Flying Technique:

Take-off: Taxi at idle on calm water, or 1/3 throttle with elevator held full "up" in rough water. Water rudder should be effective for steering. Line up into the wind, hold full up on elevator and open throttle gradually. When stabilized, release back pressure on elevator, rotation onto step should occur (if not, push **down** elevator to get it), allow to accelerate at full throttle, lift off!

Landing: Make approach into the wind, close by (50 yards) where you can see it, using partial power, very flat and ease onto water surface with a very slow sink rate. Do not stall it in! At touch-down, reduce throttle to idle, ease back on the stick as the model slows down off the step. Taxi back to the cheers of the spectators! Note: A servo-controlled choke or ignition cut-off is highly desirable to be able to shut down the engine when the aircraft is approaching hazards or people on the water!

The float attachment plates are designed to break off without serious damage to the floats in case of a crash or hard landing; a boat should always be available to recover your model. A stall-type "splash" landing may cause failure of float attachments and also may strip rudder-servo gear teeth --- avoid stalling it in! If you're dead stick, come in hot, keep lots of airspeed and **fly it on!** □

POWER BOATING

from page 41/40

speed range if you use 40% nitro fuel. If you use lower nitro fuel you might try a JG-C-20 prop. This latter prop seems to run best when the motor is mounted so that the outboard cavitation plate is the same height as the bottom of the sponsons.

Dear Sir:

I've read your articles in R/C Modeler and am like the other guys who write, with little or no knowledge about hydro; mono hulls, props and

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engines, so . . . I, too, have questions and problems without answers. I will appreciate any comment on the following questions:

(1) I have two Camaron .19 special marine engines that I would like to install in one boat. How do I go about synchronizing them?

(2) Are there any special reasons for the rudder, prop, etc., being installed behind the stern in lieu of under the boat, whether on an angle or horizontal?

(3) I don't believe in buying kits; I like to build them from scratch, whatever the cost. Is it possible to purchase drawings (at a reasonable cost) for enlargement, similar to a "Cigarette" boat?

Sincerely yours,
Leo J. Pawloski
Toledo, Ohio

I am not sure, Leo, that I am the one you should be asking about synchronizing engines used in twin powered boats. After running a twin .65 powered hydro all last year, I don't think that I ever really achieved truly synchronized engine operation! Your ear is a very good judgement tool when you are working toward this goal. The sound you are looking for is very difficult to describe but if you ever hear it you will know when they are right. The really tough aspect of this problem is that you not only have to adjust the steady state top speed settings but you would like to have both engines accelerating together. Full throttle synchronization is the easiest to adjust. Start both engines with the same high speed needle valve setting. If the engines are synchronized you will hear a single steady pitched sound. If one engine is running faster than the other your ear will pick up a "beat" in this sound. Usually you can watch the color of the exhaust of each engine to determine which engine is rich. The rich engine's exhaust will have a smoky appearance. If you can't tell this way you will have to use "trial and error" to synchronize the sound.

Once you have the high speed settings close you probably will notice that the engines do not accelerate together. If you are using exhaust throttles be absolutely sure that both throttles open and close at **exactly** the same time. Adjust your linkage until you achieve the desired synchronized sound. If you are using intake carburetors be sure that the carb barrels open and close at **exactly** the

same time. I would suggest that you set the barrel low speed stop so that the carb closes completely at low throttle stick setting when the throttle trim liner is all the way down. In this way both engines can be stopped together using the transmitter. Move the throttle trim lever upward until a reasonable starting speed is achieved. If your carbs have no idle needle valve, acceleration adjustments have to be made by adjusting the carb linkage. If you have carbs that have twin needle valves the linkage should be set so that the barrels are synchronized and the idle needles are used to tune each engine until they "pull" their loads equally during acceleration in a straight line. Fortunately for all of us it is not very critical for us to achieve truly synchronized engine operation. Most boats will take an amazingly large difference in engine rpm before the effect of assymmetric thrust is felt. Monoplanes, however, would be expected to be more sensitive to assymmetric power than a hydroplane would be.

Rudders and props are located behind the stern of most high speed boats in what is termed the outdrive configuration. The major reason for this is to allow the prop to run in a surface piercing mode. This operating mode allows larger, higher pitched propellers to be used on any particular hull and engine combination. Usually this is translated into high speed. Since the propeller is mounted aft of the stern in this configuration the rudder is usually also mounted aft of the ride plates of a monoplane. A rudder that is mounted directly ahead of a propeller will interfere with prop efficiency because of its wake production. Mounting a rudder behind or near the prop increases rudder effectiveness because the prop produces a high speed water flow in the area in which the rudder works. Most rudders on monoplanes are mounted to the right side of the prop disc so that the rooster tail doesn't hit the rudder blade or its support bracket. Any time the rooster tail hits a part of the boat, it produces a drag which is undesirable.

I am not aware of any source of plans for any full scale racing boats similar to the one you are interested in. If anyone out there reading this column knows of such a source I would appreciate hearing about it.

Dear Mr. Power,

I just got started in model boating, and have a Westcoast Marine Stingray. It is an outboard but I'm making it into an inboard with a 3.5 marine motor. What I would like to know is, how do you set up the braces to hold the engine

in place? How would I set up my engine, gas tank, etc., on the inside of my boat? I think that's all for now. Your answers would be greatly appreciated. Thank you for your time.

Sincerely,
Eric Valdez
Casper, Wyoming

The Westcoast Stingray makes a very fine running boat when converted to an inboard engine. You can, however, improve this fine hull's performance by cutting down the sides until they are 2" high. This lowers the Center of Gravity so that the boat corners better than the stock hull. As a beginner you may not want to do this. To convert this outboard hull to an inboard installation you will have to bond two 1/4" thick plywood motor bearers to the hull as shown in the figure. Cut these bearers to shape so that they fit the hull contours. Using an Octura 4-40 aluminum motor mount to line them up, bond the bearers to the hull with polyester resin and 2" wide fiberglass tape. When positioning the motor mount, be sure that your pipe clears the radio box and that you can bend the flex drive brass tubing so that the engine and strut line up. The radio box is approximately 6½" long and is about 2½" deep so that your servos, receiver, battery and switch will fit inside easily. The fuel tank should be mounted ahead of the engine using a 1/16" plywood floor for support. Cup hooks can be screwed into the top of the motor bearers and a rubberband will hold the tank in place securely. You can use Prather Class A flex drive hardware mounted on the transom. If you are using high nitro fuel (40% or more) I would suggest using an OPS 29-40 pipe mounted so that length between the exhaust port and the max diameter of the pipe is about 8½". A JG F-22 prop running at a strut depth of 1/2" would be a good place to start.

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When writing to RCM for answers to your questions, please send a self addressed stamped envelope for a prompt reply.

POWER BOATING

from page 166/40

I would suggest that, as a newcomer to model boating, you buy and read "Basics of RC Power Boat Modeling" written by David Thomas. It is a good book for anyone getting started in the hobby. You can get this book at your local hobby shop. It has also come to my attention that Westcoast Marine is no longer in business. Their fine line of boats, however, will still be available from Magic Boats, Incorporated.

Well, that about does it for another month. Remember, if you want a quick answer, send a stamped, self-addressed envelope to the address at the end of this column. Send all comments, questions, pictures, etc., to Howard Power, Hobbies Unlimited, 766 Broadway, Seaside, California 93955 (408) 394-1200. □

MUSTANG

from page 39

..... fed the whole thing from a Sullivan 8 oz. tank.

Radio:

Radio installation was well-covered in Step 20, and we found room to strap down our new Airtronics 4 channel set, for aileron as well as rudder, elevator, and throttle. Because of the weight of the .40, we installed the battery aft of the servos, and the receiver under the tank.

Flying:

The name of the game is flying, and fly we did! On the initial flight, we got off the runway at about half throttle and immediately wished we were back down! What happened? Well, it seems that your's truly forgot all about a little thing called washout **and** washin . . . and had one in one wing, and the other in the other!! That's right, children, the reason daddy's airplane kept trying to roll 'round heaven all day was because one wing had extra lift and the other didn't. In spite of everything we got down okay, corrected our problem and took to the air once again . . . this time we straightened up and flew right.

The Mustang has to be one of the all-time great advanced trainers, doing just about every maneuver we asked it to do, and with ease. To sum it up, we have to say it is very quick, very responsive, slow landing with good aileron control right up to touchdown. A real fun airplane.

Conclusion:

Okay, but is it the kit for a "novice"

to build — and fly? Well, if by novice you mean a modeler who has built a couple or three kits before, then yes. If by a "novice" you mean a modeler who has been flying 3 channel planes and wants to move up to something a little hotter with ailerons hanging on it, then yes, again. It is definitely **not** a kit for the first timer to attempt — but if you've flown and built a bit and want to put real fun into weekends . . . try Jemco's Mustang. One final word regarding the engine. Jemco says that this bird goes good on anything from .19 to a .40, and we strongly recommend a .25 for all you pilots who place yourself in the aforementioned novice category. I'm sure you'll find that the Mustang will thrill you as much as it did us, with little or no loss in its sparkling performance. □

MISS PHILDELPHIA

from page 38/32

WB1 into place. Cement the gussets on at the poly-breaks, then carve the leading edge to shape. Bend a piece of 1/16" m.w. to fit the trailing edge and Hot Stuff it in place to protect against rubberband cuts. Don't forget the 1/4" spruce stub spars in the C/S.

Tail Feathers:

These structures are built flat on the board. Use rock hard balsa for the center spars on both parts, and soft balsa for the rest. We laminated the rudder/fin outline from eight pieces of 1/32" x 1/4" soft blasa. We didn't even need to use water! The only spruce needed is the elevator joiner. Once these parts are dry, sand the edges round and fit them to the fuselage.

Covering:

We used plastic film. If you use anything else, take care not to warp the structure.

Assembly:

Epoxy the tail surfaces in place. Install the 3/16" wing dowels. The 1/8" dowel cabin brace should be fit at this time, but not installed until the top block is covered. Before you cement the windshield and side windows on, install the radio system components in order to achieve the proper Center of Gravity.

Flying:

Not too much to say here really. Do a **careful** pre-flight. Use 1/2" travel each side for rudder, 1/4" each way for elevator. As you might expect, the big elevator is powerful! For electric, we found an 11d/7.5p prop works best. Surprisingly, ours ROG's just fine on its forward placed landing gear. You'll find your Miss Philly to be a gentle, forgiving fun flier with just enough "ugly" to be truly unique! □

When writing to RCM for answers to your questions, please send a self addressed stamped envelope for a prompt reply.

FLYING LOWE

from page 23/22

Chidgey and I got together on the outcome of the last CIAM FAI meeting held in Paris. Ron is our U.S. Pattern representative to the FAI and will be reporting the meeting in the AMA Model Aviation Magazine. The facts are these: For 1982 and 1983 International competition and for the 1983 World Championships (which will be held somewhere in the U.S.) the rules are essentially the same except for the addition of some maneuver choices and a change in the K factors for some of the present maneuvers. The maneuver changes are as follows:

New Maneuvers:

Vertical down 4 pt. roll K = 3.
Four turn spin (two opposite) K = 4.
Rolling Circle (roll inside or outside) K = 5.

K Factor Changes:

Rolling 8 — from K = 2 to K = 3.
3 Reverse outside loops — from K = 3 to K = 4.
Inverted spin — from K = 3 to K = 4.
Sq. Horizontal 8 — from K = 4 to K = 5.
Aileron turn — from K = 3 to K = 2.
Reverse point roll — from K = 4 to K = 5.

Okay, now for the bomb: effective for International competition in 1984 and the World Championships in 1985, a new pattern will be flown, called the "turnaround." It is essentially an Aresti type such as flown in full scale aerobatics and the Las Vegas Tournament of Champions. As presently conceived it will consist of 17 maneuvers with a maneuver in front on each pass plus judged turnaround maneuvers.

I flew the pattern several times in practice and in demonstrations at the Tangerine. I used my Ulery Laser 200 T.O.C. airplane. The ship flew the pattern very nicely, requiring about 4 minutes to complete once airborne. We didn't get a chance to try the pattern with a standard pattern ship, but it is apparent that some airplane

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FLYING LOWE

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changes will be desirable for best results in the pattern. The pattern as presently constituted is shown in Table 1.

The airplane rules as presently conceived are similar to present FAI rules, i.e., 11# weight limit and .61 cu. in displacement (two cycle) and 1.2 cu. in. limit for four cycle engine. The maneuver "box" is 60° x 60° x 60° as present, although the box, per se, will not be judged. Maneuver placement for easy judging and symmetry is important. This obviously means that turning around a half mile away won't cut it. I feel that what is needed is a fairly slow airplane with lots of wing (low wing loading) and a real good power loading or lots of thrust in slow speed flight. The Vegas T.O.C. airplanes fit this description but are illegal due to weight and engine displacement used by most of the competitors.

How this FAI pattern change will influence the present AMA patterns is up to us and the AMA R/C Contest Board. I personally feel that we will have to adopt the concept for the Masters class. Common sense would dictate an influence into the other classes so that we maintain a natural pattern progression such as we have now.

I would like to have your opinions on this. Also, you should contact Joe Friend, your AMA Pattern Contest Board chairman. I'm sure you will be hearing more about this in the near future.

Enough said for now; we'll get into this some more next time. □

CUNNINGHAM ON R/C

from page 16/14

on and on and on. Too bad that I didn't mention all of this before Christmas --- well, there is always next year. But, after you have acquired all of the tools that you think that you're going to need, and after you have set up the perfect building board, and after you have started on that super perfect project, how are you going to keep your workshop clean --- beats the heck out of me.

☆

In the October '81 issue of RCM, Dick Tichenor presented his "Big Bird," low wing, landing gear equipped powered glider. This tickled the interest of Helmer J. and myself so

we built a couple. HJ used a Windrifter wing that was laying around, and I used a 9' Floater wing. HJ built his exactly according to the plan, while I, being a bit lazier I guess, built a simple Kaos type fuselage. We both used sheet metal gears located ahead of the wing, and we both used .15 engines with about 5° of downthrust for power. Both aircraft use three channels of radio and four ounce tanks. Each is a real blast to fly. You can shoot touch and goes all day long, or you can climb up to altitude and chop throttle to idle and thermal around, or you can pass around the transmitter and let others get the feel of flying R/C. All in all, it's a nice, simple form of enjoyment, and perfect for a relaxing afternoon of flying. Dick really hit on a nice, fun type of set-up. If you are a jaded RC'er who is tired of flying all-out all of the time, give this type of aircraft a try. The low wing set-up does eliminate any unwanted rolling tendency and the aircraft really flys well.

The other day I heard from a flier in San Antonio who had built a Lazy Ace and equipped it with an Evra 190 for power. Now, the Lazy Ace was designed to be flown with a .61 engine. When the .90 size and the twins came along, many builders equipped their Aces with these types of power with very great success, but, it really wasn't designed with the large gas engines in mind. However, Al tells me that his Evra 190 equipped Ace is really a ball to fly, fully aerobatic, and the only modification that he made to the structure was to run oak engine mounts (the Evra is a beam mounted engine) down the inside of the fuselage sides. The Ace utilizes spruce spars with webbing, so these wings have proven to be strong enough to handle the extra weight and power. The Evra is a simple, inexpensive large engine that has generally been overlooked. Its big problem has been in starting, since hand flipping does not turn over the engine fast enough to get its ignition system to work correctly. The answer is a rope starter. Al reports that his is easy to start and idles nicely, with lots of power for an aircraft the size of the Lazy Ace. In talking to Jim Martin of Hobby Lobby, for whom the Evra is built, I found that an adapter for older Evra engines is available consisting of a rope starter pully and a pull rope. I ordered one, and plan to resurrect my early model Evra, and am going to put it into the nose of my Dopple Decker Bipe. Power has been an O.S. .90. I'll report more on this later.

☆

The really beautiful thing about R/C is that there are so many things to

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CUNNINGHAM ON R/C

from page 179/14

do, so many different ways to enjoy this sport. If you don't want to invest much money you can go the two channel/glider or foam trainer route. Speaking of this, I was flying at the field the other day and watching a young man have an absolute perfect afternoon. He was flying his first R/C model, and was pretty much self-taught. He was flying a Goldberg Gentle Lady glider with a power pod on top and a .049 for power. Two channel radio completed the set-up. A beautiful flying machine, and one that had given this young man many hours of pleasure. He was thinking about moving up to a larger power aircraft, but bet he still keeps that Gentle Lady around for a relaxing afternoon. Be it a jumbo model or a 1/2A glider, or a Big Bird, there is something in R/C for everyone.

Time to tell you that the Fifth Annual Jumbo R/C Fly-In will be held again this year at Thunderbird Field, just west of Fort Worth, Texas. It will be exactly the same as past years; aircraft will be limited to bipes with a wingspan larger than 60" and monoplanes with a span larger than 84", or an aircraft that is 1/4 size of the full size aircraft. The dates of this super fun time will be July 17 and 18 (Saturday and Sunday) 1982.

Make your plans now to attend this show. I know you will have a good time. □

ENGINE CLINIC

from page 13/11

desirable. It is the only way the front bearing receives lubrication. If there

were no leakage at all the front bearing would run dry and eventually fail. On the other hand, if you can see fuel spraying out the bearing and the nose of the aircraft is wet with raw fuel then there is excessive leakage. A drop or two every few seconds is perfectly normal and yet many times fellows will think this is excessive. So how badly your engine is leaking I do not know.

Some of the K & B .40's did leak quite a bit out the front bearing but if returned to the factory they replace the front ends and test run the engine to make sure they are not leaking more than normal. Naturally after break-in or additional running, things can change. A lot of fellows fly under dirty conditions without air filters and give no thought to the dirt going down the intake lapping out the seal area until they see the fuel blowing out.

The latest run of front plates have a spiral groove machined in the aluminum casting that helps eliminate any excessive leakage. By looking down the intake (carburetor removed) with the crankshaft port about half open you will be able to see the machined spiral groove. If your engine does not have this, pick one up that does or send the engine back to K & B and tell them to install a front plate that does. Due to the pressed-in roll pin used to retain the prop drive washer, it is a little difficult to pull the crankshaft from the housing and unless you do have the experience and proper tools it is best to let K & B do the job. However, as you have previously replaced the front bearing, I am assuming you do have the knowledge and equipment for doing the job.

Dear Clarence,

I have a K & B .61 R/C with Perry carb and pump. I've had it for about a year and have a problem that persists.

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When writing to RCM for answers to your questions, please send a self addressed stamped envelope for a prompt reply.

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It's got a beautiful top end, fair to good mid-range and an excellent idle. However, if after I let it idle for a short time (10-20 seconds), and then push it into mid-range it spits and sputters and usually quits. To prevent this, I have to idle it about two to three times faster than normal; which doesn't work too well on approach in a lightweight Super Kaos.

I've read the instruction sheet on how to tune the Perry pump and carb a number of times and have fooled with the adjustment over and over again to no avail. I'm using a wood 12/6 prop. Could this be part of the problem?

In an issue of RCM you said, "The main function of the Robart Auto-Mix is to reduce line pressure at engine speeds where there is lower fuel demand (idle)". Could this be what I need? If not, what's the solution?

Thank you for your help.

Matt Dralle
Davis, California

Matt, you did not say what you are using for fuel or glow plug. Either or both can make a big difference in the way an engine accelerates. It sounds to me as though your fuel or plug is too cold allowing the engine to load up. The idle mixture could also be set a little too rich. Try changing fuel brands and be sure you are using a fuel in the 10%-15% nitro range; also, either the Fox or K & B idle bar glow plug. There are a lot of other good glow plugs and also some poor ones. These two I know for sure will work without problems.

You may also have the pump pressure set too high. The main purpose of the pressure adjustment on the Perry pump is for setting the mid-range. However, I have seen many cases where backing the adjustment out all the way would still not lean the mid-range enough due to fellows using "home brew" fuel, non-idle bar glow plugs, etc.

The regulator portion of your Perry pump automatically senses pressure of the fuel in the line and cuts back the amount delivered to the engine at idle. Installing a Robart Auto-Mix would be of no advantage. It would only defeat the purpose of the pump regulator.

Dear Mr. Lee,

I would like to know if an engine with an ABC set-up will normally have good compression when cold or does this come about when the engine is at operating temperature? I have a K & B 3.5 which has very good compression

hot or cold but my "Saito" four stroke has very poor compression when cold or hot right after running. But, it does run very well! (11,000 rpm on a 10/4). Thank you.

Yours truly,
William G. Mitch
Hebron, Indiana

An ABC piston/sleeve engine should always have good compression when cold — more so than when hot. Most ABC piston/sleeves are fit a little tight at the top when cold. When hot or at operating temperature, the sleeve expands more than the piston resulting in the correct running fit. The more nitro used in an engine and the hotter its operating temperature, the tighter the piston/sleeve fit. This means that engines intended for sport use and low nitro can be fit looser than high nitro racing engines. At any rate, any ABC engine should have its best compression when cold. In the case of the Saito four stroke you also have two valves that can leak. I have a Saito myself and mine does have some valve leakage which is normal with four strokes. To stop all valve leakage, considerably heavier valve springs would have to be used which would result in wear of the valve actuating mechanism. Compression / combustion pressure will help seal the valves but even so when turning the engine by hand you will get some leakage. Lapping the valves with a fine lapping compound will often help considerably. Just don't expect a four stroke engine to have the same feel that a two stroke does. There is also the possibility that the piston/sleeve fit is a little loose whereas the K & B 3.5's are set up almost "squeaky" tight when new. My Saito, however, has excellent compression when cold but not as much as the K & B 3.5.

Dear Mr. Lee,

I have a 1973 O.S. Max .40 R/C engine which is fitted with a Dykes compression ring. The motor is in good condition with a satisfactory piston/cylinder fit. It was recently necessary to fit a new ring after the original was damaged during a strip down. Unfortunately, I found it impossible to obtain a new ring but a friend turned me a replacement in cast iron on his lathe, this was a perfect fit and the cylinder liner was roughened with fine emery cloth across the bore to bed in the new ring. Since then the engine has had one hour running on straight fuel but the ring shows little sign of bedding in and only just enough compression to start it.

I have considered putting a few drops of metal polish down the carb when the engine is running but I feel it might cause unnecessary wear on the

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small and big end bearings which are at present in good condition.

Your kind advice would be appreciated.

Yours faithfully,
Ken Mergatroyd
Manchester, England

There is a little more to making and fitting a Dykes ring than many fellows realize. It is pretty hard for me to say exactly what your problem is without being able to see the replacement ring. One thing for sure — I would not run any metal polish through the engine. It might help seat the ring but wear out a few other parts doing so. You might try a little Fox Lustrox that has more of a polishing effect than metal removal. This will often help seat rings that have become glazed due to rich running and will not seat. It may be a case of the cylinder wall not being roughed up enough and the ring became glazed before seating. This is why Dykes ring engines usually have a pretty rough hone finish to the sleeve.

Although Dykes rings are referred to as "no tension," K & B uses an installation tool for slipping the ring over the head of the piston that expands the ring slightly so that it does have a small amount of wall tension. You can do this by hand if careful. Then slip the ring into the cylinder and hold it up to a bright light. No light should show through. If it does, keep reshaping the ring until there is no light leakage. This may take a bit of patience. Also be sure and face the bottom of the ring on a piece of 400 grit emory paper with oil on a flat surface to get rid of any machine marks. Then carefully install the ring on the piston.

There is also the possibility that the ring land on the piston is worn so that the new ring does not seat on the land. This is just as important as seating against the cylinder wall. This being the case, a new piston would be required. □

SUNDAY FLIER

from page 6

"No control," said the pilot.

He checked everything, and in the process found out the batteries had gone down too far.

"I don't understand it. I charged them all night last night, & they read full voltage under load. That was only

the second flight, and the first flight was only ten minutes."

"What load?" someone asked.

"The usual --- 250 ma on my Expanded Scale Voltmeter."

"What loads were your servos putting on the battery?"

"I dunno. Whatever they're supposed to."

"Mebbe you ought to check them out."

So he did. In the process, it was discovered that the engine servo was stalling at full power; also, the gear retract had not been coming all the way up to lock, and that servo was holding under a full stall condition. The combination, plus the loads imposed on the flight control servos, had rapidly drained the batteries during the first flight, and they just didn't last through the second. Stalled servos can pull over 400 ma, so I am told. Take two of them, add the drain on control surface servos, and your battery pack just can't take it.

Like everybody else, I've had battery failure in flight. But no more. Last year, at the Toledo show, I saw R.F. Enterprises "Servo-Gard," a unit which goes a long way towards preventing crashes due to low battery power. You put it in series with the engine servo, and when the battery voltage drops below 4.6 volts, it causes your engine servo to go to a preset position --- usually idle --- and still gives you several minutes in which to land safely.

I obtained one of the units, and installed it in a new amphibian design. It worked fine on the bench, and I demonstrated it to anyone who was interested. Then I forgot about it. I hadn't had any battery problems for some time; it is routine for me to charge regularly before flying. Then, one day a couple of my young friends came by and wanted to go flying. We did --- but I hadn't planned to fly the amphib. However, they kept bugging me until I finally gave in.

"Okay. You guys get it out of the car, set it up and check it out, and we'll fly it," I agreed. They raced to the car, brought out the plane and all the ground support equipment, and put it all together. Perhaps you think I was too trusting, and maybe I was, but I have found that it gives young people a lot of confidence in themselves if you display a trust in their ability. Sometimes it backfires, but the risk is worth it.

So, when our turn on the flight line came, they fueled up the plane, took it to the ready line, and we fired it up. Control checks were good, so I taxied the plane out, took it off, and flew it for them. Midway through the flight, as the plane passed overhead, I pulled up to do a stall turn. Even before I throttled back and prepared to give it rudder, the engine went to idle. I tried to give it a blast of throttle to make the rudder turn; no throttle. As it flopped over and came nose down, I tried the throttle several times. Nothing --- stayed at idle. My first reaction was that the fuel draw was faulty, then all of a sudden it dawned on me --- the warning signal! Low batteries. Fortunately, the idle speed gave a very slow sink rate, and I brought the plane around and landed it.

We retrieved the plane, and I checked the batteries with my Accu-Tach (more about that later). Sure enough, the voltage was below 4.6 volts. The Servo-Gard had saved my amphib. from a potentially fatal crash. In all of the confusion and excitement created by the guys nagging me to fly the plane, I forgot that I had not charged the batteries for over two weeks! The Servo-Gard took care of it. So, my advice --- get one, install it, and don't take off without it!

Don't ask me how it works; I don't know, and I don't really care, so long as it does work. And the unit looks just like a KPS-14 servo on the outside, except for two pigtails and an adjusting screw hole in the top. You

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can get one from R.F. Enterprises, 106 N. Main St., Arlington, Ohio.

There's another "fail safe" device being marketed by an English outfit called Chromatronics that sounds very promising. It has a different function than Servo-Gard, in that it responds to interference or lack of transmitter signal by causing all servos to proceed to a preset condition, then, if a proper signal is once again received, the airborne unit returns to normal operation. Thus, if interference occurs, and you have properly adjusted the preset locations for your servos, theoretically you can set the model for "free flight" glide in a gentle turn to landing, although you can't control the spot where the landing will take place. But it beats an uncontrolled crash due to interference.

The Servo-Gard does not protect against outside interference, and the Chromatronics unit does not protect against low battery voltage. Wonder if the two could be installed with the Servo-Gard inserted in the engine servo circuit of the Chromatronics? How about it, you electronic experts? Then we duffers would be protected all around. Give it some thought.

☆ ☆ ☆

Earlier above, I mentioned checking my batteries with my Accu-Tach. Howzat? Checking batteries with a tachometer? Yep. Well-l-l, not really. The Accu-Tach is a combination tachometer and battery checker device which I have found particularly useful. The tachometer is a digital readout, with two scales, one to the nearest one hundred rpms, the other to the nearest ten rpms. The latter scale isn't too good for reading reciprocating engine rpms, because they vary too widely, but it is fine for electric motors.

We have an on-going discussion in our club about the relative merits of digital versus analog readouts, both for rpms, and for voltages. The analog devotees say a quick look at the scale tells you whether you're in the right ballpark --- something like looking at the clock and saying, "It's about twenty to eight," instead of looking at the digital reading and saying, after a brief pause to assimilate the data, "It's seven forty one." The digital fans say, "Yeah, but when you do get a reading, it's more accurate." To each his own. I like 'em both, but the reason I find the Accu-Tach useful is the several functions it performs --- tachometer,

voltmeter, battery checker under load, battery cycler, and quick charge overcharge protection. That last mentioned feature is one that I don't happen to use, since I have one of Doug Spreng's units (no longer on the market) which has a sensor that prevents overcharging. But if you don't have one of those, then a quick charger, used in conjunction with the Accu-Tach, can give you a full charge without overcharging.

The way it works is to connect the Accu-Tach across the terminals to read the charging voltage, then, as the voltage comes up to full value, watch the readout on the Accu-Tach. It reads to the nearest one hundredth of a volt, and when it peaks out, then shows a drop of one hundredth of a volt, you're up to charge and it's time to quit. Any more, and you could overcharge and damage the battery pack. Again, don't ask me how it works, but it does. As the old saying goes, "read the instructions." The Accu-Tach is made by Norcal Avionics, P.O. Box 70956, Sunnyvale, California 94086.

☆☆☆

As I said at the beginning of this column, the R/C hobby/sport is really getting sophisticated in the electronic circuitry that is being developed. However, all of this good stuff would be pretty useless if it weren't for another developing area. I refer to the assignment of frequencies for our use by the Federal Communications Commission. There was a time when only one frequency was available; now there are fifteen --- although it is true that the five located in the 27 MHz bands are virtually useless due to citizens band activities in most areas. Also, in recent months some of the 72 MHz bands are very risky, since they are shared by industrial users. But the AMA Frequency Committee, working with the FCC, appears to be coming up with some solutions; if all goes well, those solutions will be available later on this year. That's good news --- and I do mean Good news.

For a number of years, Dr. Walter A. Good has served on the AMA Frequency Committee. As a scientist at John Hopkins Applied Physics Laboratories, he was a respected authority and patient negotiator for the AMA with the FCC. Although he is now retired, he has continued to serve on the Frequency Committee, quietly helping to collect, assimilate, and disseminate all the intricate technical information which is involved in obtaining allocated space in the frequency spectrum. There is no way I know of to measure the amount of effort which Dr. Good has put into attaining frequencies for our use. I sincerely believe we would be nowhere near as far along as we are were it not for Walt's services.

So I think we should do something for Walt. Now he does not know that I am doing this, so I'm going to ask all of you Sunday fliers, as soon as you finish reading this, to sit down and drop a card to Walt, and tell him "Thank you for all you've done for us, the Sunday fliers of America." Walt's address is: Dr. Walter A. Good, 2902 Seashore Drive N., Port Richey, Florida, 33568.

And, Walt, as the Old Chief Sunday Flier, let me add my heartfelt thanks to you --- and also to you, Joyce --- for all your efforts on behalf of the sport of R/C fliers in America.

Okay, you Sunday fliers. Send Walt a card of thanks. It's the least we can do. But maybe the most.

Sometimes it's more satisfying to know that you are appreciated than it is to get a mere material gift.

Thanks, Walt. We luv' ya! □

FROM THE SHOP

from page 4

..... *cabin structure. I had finished the re-construction of the cabin but not replaced the windows. Kneeling by the bench working on the lower part of the fuselage I glanced up — there, 4" from my face, thrust through the opposite window was the "smiling" face of Pussy. At that range even those teeth look like a sabre-toothed tiger — anybody want a small furry parcel — cheap? Please send a stamped addressed envelope to Singapore Institute for the Palpitating Heart.*

Mike

Hang in there Mike, just think, Ms. Cat may possibly bless you with a litter.

★

Patricia Frederick sent us the following poem, we loved the subtle last verse. Patricia's husband is Steven Frederick, Tri Rivers R/C Modelers of Painted Post, New York.

R/C Modeler's Wife's Lament

Has anyone seen my Handiwrap?
The sandwiches are stale and hard;
Where has the Elmer's gone, again?
Susie needs to glue a card.

I couldn't find the iron today,
To press Pam's dress for church;
Up and down and all around
The sewing room I did search.

The scissors have disappeared, once more;
Oh where, oh where could they be?
In the corner, over there —
Under a stack of R/C's.

I used the pins only yesterday,
To fix that old red coat;
Do you think that they took wings,
And suddenly they did float?

"Where's Daddy?" called the kids one day.
"In the cellar, I guess."
"He's not there," was their reply;
"It's just a great big mess!"

The truck's gone and to the field he took,
The red plane, the yellow and the green;
His trusty radio and streamers
Are all that can be seen.

Please Note:
The situations described above do not necessarily refer to the writer's household.

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Many thanks, Patricia, we understand, a lot of us have done the same thing.

See you next month. □