



# KWIKSILVER

---

**A .40 powered, compact multi that ranks  
with the best in competition machines.  
Wing is modified Falcon .56.**

---

*By LARRY ROSENBERG*

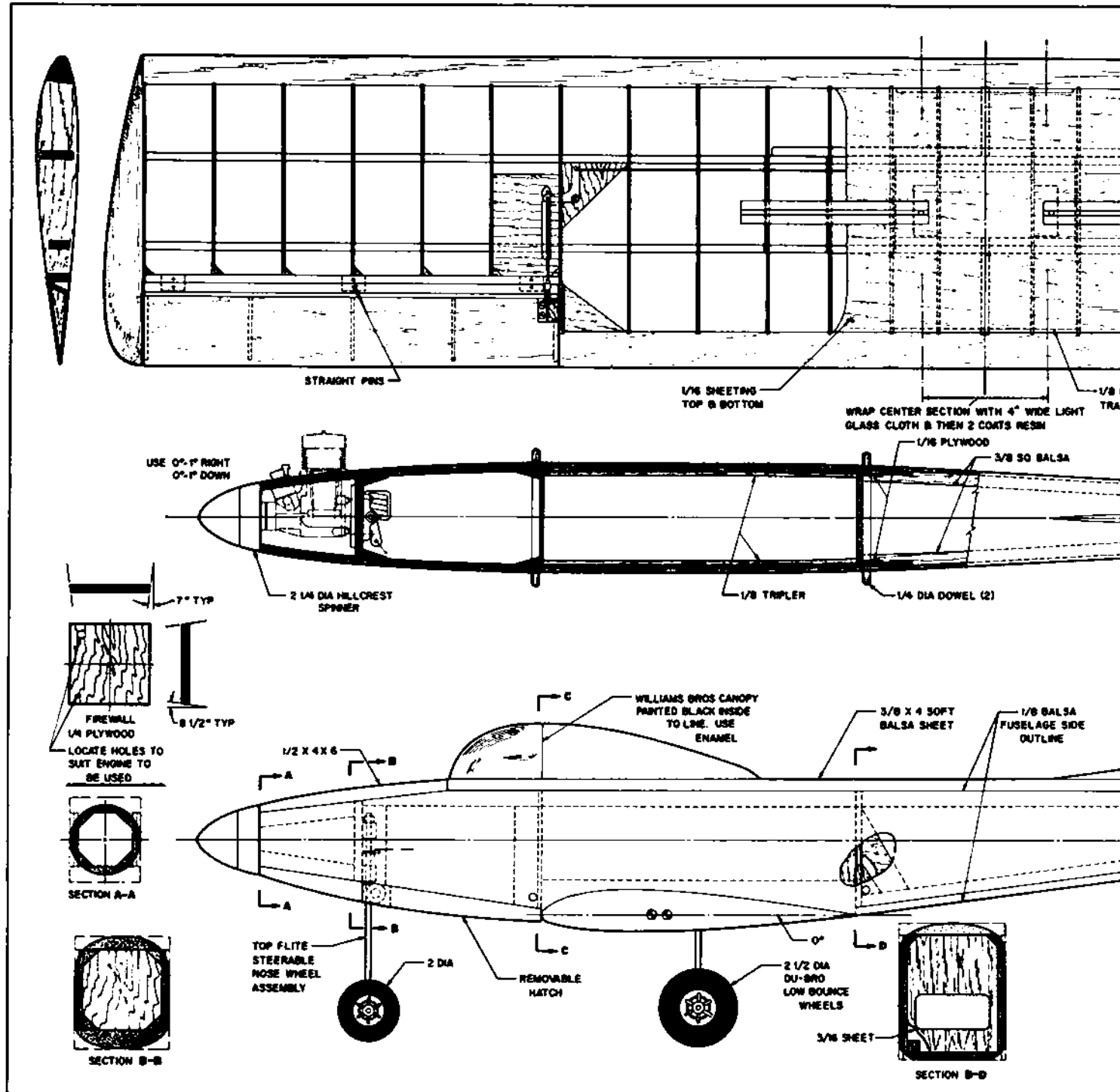
**I**T would be nice to begin this article by stating in typical fashion that this is a contest winning airplane that has filled my home with trophies and is the answer to the stunt flyer's dream. However, this would not quite be the truth! Although the Kwiksilver is capable of flying the entire AMA pattern, and flying it very well indeed, I have never entered it in an R/C contest and have no immediate plans to do so. Rather, I fall into that huge mass, loosely classified as "Sunday Flyers," and enjoy this phase of R/C very much. This should not be misconstrued to mean that there is a significant difference between a good "Sunday Flyer" and a good pattern airplane, for I feel that most flyers will agree that there is little difference in the

flying characteristics of the contest plane vs. the sport plane, if both are sound designs.

After progressing from single channel escapement through pulse rudder, galloping ghost, and 10 channel reeds (none of which I mastered), I had an opportunity to fly an airplane equipped with a genuine WORKING proportional system last year. The airplane was Doug Spreng's late Kwik-Fli, equipped with one of the first Micro-Avionics proportional systems. After many hours of defensive flying on reeds (mostly in defense of the crashes while explaining the intricacies of reed flying to my wife), this introduction to proportional was truly thrilling. I was hooked.

Doug finally repossessed his transmit-

ter and took advantage of the opportunity to fly his own airplane while I immediately went home and put my reed rig up for sale. While waiting for a paying customer, I haunted Doug for chances to fly his ship while beginning the difficult process of trying to rationalize to my wife why proportional was such a great thing and just how vital it was to my mental well-being to obtain one. Finally, after much selling, swapping, and "intelligent" discussion with the boss at home, she relented ("buy the %& thing and shut up!"). I immediately did buy it and now have about 10 trouble free months and 225 flights on my Micro-Avionics rig. The highest tribute that I can pay to it is to say that all that I do is to flip the switches and fly,



week after week.

After acclimating myself to proportional with a Stormer, a couple of Jennys, plus some oddballs, I decided that I wanted something a little bit different. I possessed a very compact and light-weight radio system and was tired of 12 ounce fuel tanks and big radio compartments with the radio lost in one end of them. I felt that a smaller ship could be built which would have all of the attributes of a large multi ship plus the added features of less fuel consumption, less building time (and expense), and which would fit into my car assembled so that I wouldn't have to start strapping it together at the field. I therefore decided that the time had arrived for me

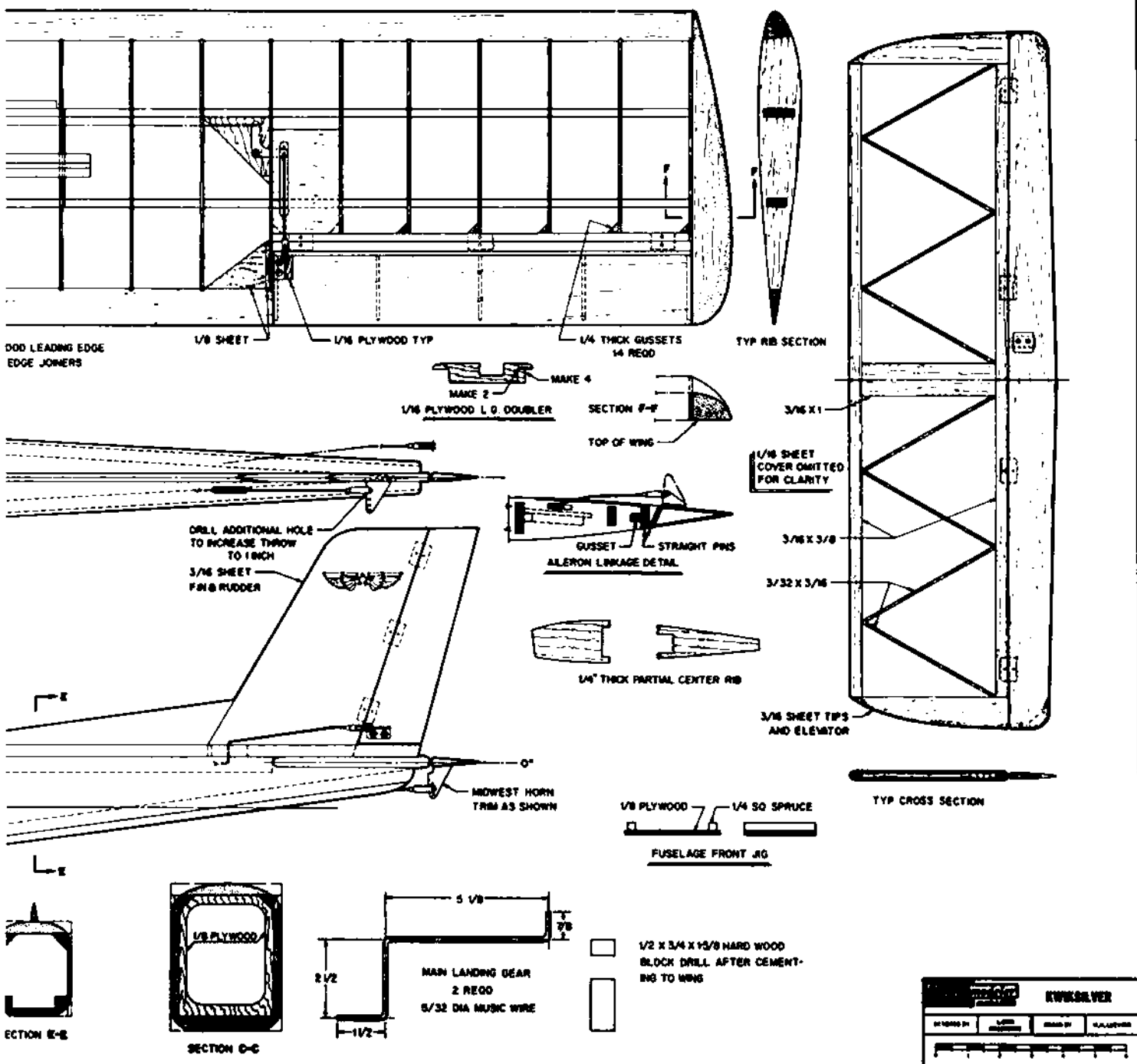
to become an airplane designer. The result is the Kwiksilver.

The actual designing of the airplane was not too difficult. I took a very short course in the fine art of aero (model) nautical engineering from an article by Chuck Cunningham in RCM. The only deviation from Chuck's teachings was to reduce the overall size of the airplane by a factor of 1 engine size. I felt that the lightweight radio gear and the powerful engines available in the .40 class permitted a reduction in size without an undue increase in wing loading.

The Kwiksilver has a 54 x 10 wing yielding 540 sq. inches. At 5 lbs. flying weight the wing loading is about 21.3 oz./sq. ft., a loading that I feel is just

about ideal. A 25% stab and a 7.5% fin fill out the picture. Long moments help, too, and the fuselage shape evolved around the engine, fuel tank, and radio gear.

I see no advantage to tapered wings or stabs on our models and feel that the old barn door surfaces are about the most efficient. After experimenting with zero dihedral wings on a couple of other models, I decided that they were just as easy to fly, or easier, and a heck of a lot faster to build. The sidewinder engine mounting has become a trademark of mine at the field and I feel that this type of mounting offers great advantages to the modeler. The vibration due to the engine is largely absorbed by the wing



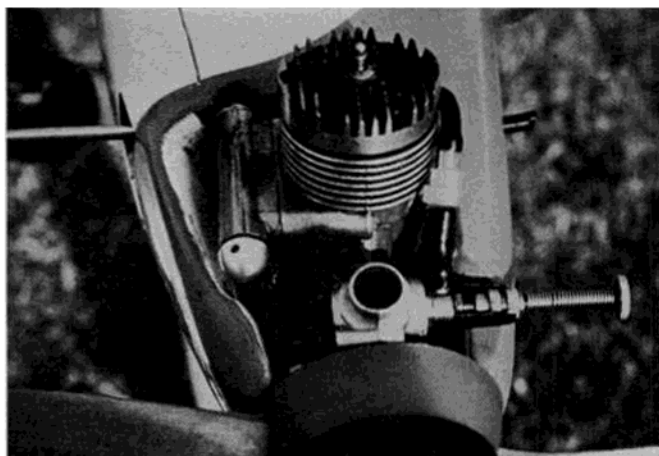
structure (per Dr. Good's article in RCM and you cannot convince me that vibration helps anything! The fuel tank level, with relation to the needle valve, is ideal, and this setup cures many seemingly impossible idle problems. Also, most of the oil and exhaust garbage are thrown down and away from the airplane with the result that it stays much cleaner. I also feel that it adds quite a bit to the looks of the airplane to have a smooth cowl line.

The actual construction of the airplane is very straightforward and I doubt if any difficulty will be encountered by the average builder. A few comments before going into the details. On any ship of this size, weight is very

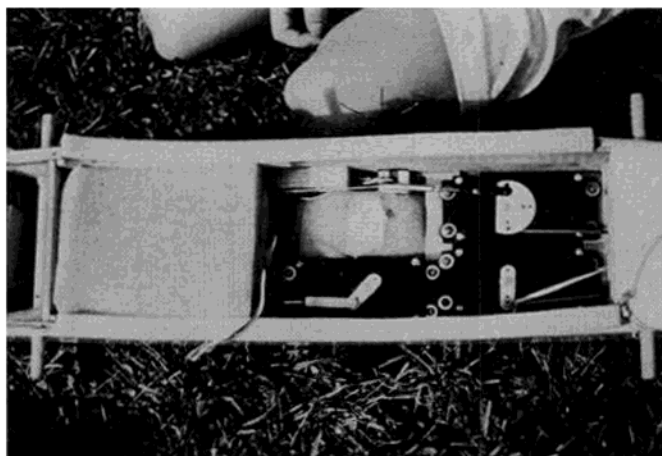
important. At five pounds, this ship really moves out with a Max .40 R/C in the nose. It will do the entire AMA pattern on a six ounce fuel tank and leave you enough fuel to practice a few touch-and-go's. If you stick to the wood weights called out in the list of materials, don't try to beef the ship up, and don't weight it down with 2 lbs. of paint, you should come out around five pounds and have a most enjoyable little airplane.

The loops are quite good with excellent tracking. The rolls are axial; it spins well and will self recover by neutralizing the controls. The ship really rolls like crazy to the left (with engine torque) and I have my ailerons set so that full right gives me the roll rate that

I like for consecutive rolls and full left is used in maneuvers such as the Rolling 8, where you want instant flip! The elevator response is very smooth and the ship is not jumpy around neutral. The stall turns (wingovers?) are also good and the ship just seems to pivot around the wingtip. The real treat, however, comes during a landing. The ship has a positive, but not excessive, sink rate and once lined up on the approach, it will not balloon or yaw around. Just hold her steady and flare out like a real one. You can drag this ship into the circle, bring it in with a full up-elevator landing, and she won't fall off on a wing. The windy weather handling is also very good, a real bonus in a ship of this size.



Max .40 installation in Kwiksilver.



Micro-Avionics servo installation

## KWIKSILVER

### List of Materials

#### FUSELAGE:

- 2 1/8 x 4 x 48; sides; medium hard
- 1 1/4 x 4 x 36; bottom rear sheeting; soft
- 1 1/8 x 4 x 48; doublers; medium
- 2 3/8 x 3/8 x 36; lower corners; soft
- 2 1/2 x 1/2 x 45; upper corners; medium
- 1 3/8 x 4 x 48; top deck; soft
- 1 1 x 4 x 12; lower nose block; soft
- 1 1/2 x 4 x 12; upper nose block; soft
- 1 3/16 x 3/4 x 36 T.E.; former braces; medium hard
- 1 1/4 x 4 x 3 1/4; firewall; ply
- 1 1/8 x 4 x 3 1/4; F1 former; ply
- 1 3/16 x 4 x 3 1/4; F2 former; medium
- 1 1/4 dia. x 12; wing dowels; birch

#### EMPENNAGE:

- 1 3/16 x 6 x 48; skin; medium soft
- 2 3/16 x 1/2 x 36; L.E. & T.E.; medium soft
- 2 3/16 x 3/32 x 36; trusses; medium
- 1 3/16 x 4 x 36; fin, rudder, elevator, tips; soft

#### WING:

- 1 Falcon 56 wing kit
- 1 Set Top-Flite landing gear blocks & clamps
- 1 4 x 24 Fiberglass tape
- 1 1/4 x 1 x 36; spar splices; rock hard
- 2 3/16 x 3 x 36; aileron skin; medium
- 2 3/16 x 3 x 36; center sheeting; medium hard
- 1 1/8 x 1 x 36; aileron front sheet; medium
- 1 1/4 x 1 x 36; aileron mounts; medium
- 1 3/16 x 6 x 12; gear mounts, splices, etc.; ply

#### MISCELLANEOUS:

- |  |   |
|--|---|
| 1 10" Williams canopy                          | 1 1/16 I.D. x 12 brass tube for motor push-rod    |
| 1 Tatone mount                                 | 1 3/32 I.D. x 12 brass tube for steering push-rod |
| 1 Top-Flite nose gear assembly                 | 8 Kwik Links                                      |
| 1 Package DeBolt nylon hinges                  | 6 3/32 I.D. wheel collars                         |
| 4 Midwest Horns                                | 1 6 ounce tank                                    |
| 2 Midwest aileron bellcranks                   | 2 2 1/2 dia. lo-bounce wheels                     |
| 2 1/16 dia. x 36 music wire for linkages       | 1 2 dia. solid nose wheel                         |
| 1 3/64 dia. x 36 music wire for motor push-rod | 1 1/4 x 1/4 x 36 hard balsa for pushrods          |
| 1 3/32 dia. x 36 music wire for main gear      | 2 yards medium weight silk                        |

Enough said? Let's build.

### CONSTRUCTION

#### Fuselage:

The fuselage structure is very simple, strong, and light. After cutting both fuselage sides to shape, glue the 1/2 x 45° upper longerons and the 3/8" sq. lower rear longerons in place. Then contact cement the cross grained 1/8" sheet doublers in place. Cut the top deck out of the 3/8" x 4" sheet, cutting the fin slot at this time. After marking the former locations on the sides and top, epoxy the 3/16" x 3/4" T.E. stock in place on the sides, as they will aid in lining up F1 and the firewall. Now assemble this whole mess, except for the firewall, upside down on a flat board. While this is drying, you can install the Tatone mount and nose gear brackets to the firewall, drilling the required holes for the throttle pushrod and fuel line. Now install the firewall with epoxy glue and hold the nose together with the simple jig shown on the plans.

When all of the above structure has dried well, the lower 1/4" sheeting and the upper and lower nose blocks can be glued in place. Be sure to just tack glue the hatch block in place. Now remove the nose jig and start carving and sanding. This part of the construction goes quite quickly, and in an hour or so you should have a really sleek looking fuselage. Don't be afraid to round off those corners, there is plenty of meat behind them. Sand the entire fuselage well, as the ship will be a lot lighter if you sand the wood off to smooth it out, rather than adding the filler later. Now cut into that sleek nose shape to permit engine installation (this really hurts) and mount your servo rails, etc., for your radio installation. There is adequate room in this ship for most propo systems. At this time, install all motor and steering pushrods and fit the tank in place. Now give it one good coat of clear dope and put it away for a while.

(Continued on Page 83)

minimum of a two inch spinner will be required. Scale points as such will not enter into the racing except in case of ties. In other words, construction can be relatively simple so long as the overall appearance as viewed from a reasonable distance duplicates the intent of the rule. Minimum wing area will be increased to 525 sq. inches and the minimum wing thickness will be 12%. Minimum weight 5½ pounds, minimum cross section height 7½", and minimum width 4". This should produce an aircraft capable of being flown by a flyer of average proficiency and at a far more realistic maximum speed. Also, the designs will probably be excellent for stunt applications and can be used for every day flying sessions rather than strictly racing, as is the case with current specialized Goodyear designs. The higher minimum weight will permit simplified construction and will undoubtedly encourage the use of fiberglass fuselages and foam wings to minimize construction time. A side benefit of the extra weight will be that it will encourage better finishes and, of course, more attractive, durable aircraft.

The handicap system as proposed will closely duplicate that used in automobile and motorcycle racing. The first heats will be flown strictly for qualifying time. The four fastest airplanes will then compete in a trophy dash for a prize equal to, or greater than that awarded for the main event. Handicaps for the main event will be arrived at by taking ½ of the time difference between the fastest and the slowest aircraft up to a maximum of 25 seconds. Therefore, the fastest aircraft will start last with their handicap based on qualifying times. In case of equal qualifying times, or in the case of aircraft which have been given the maximum of 25 seconds handicap, the starting order will be determined by the contest director based on overall appearance and approximate similarity to scale. Two second starting intervals will be used. It has also been suggested that existing Goodyear aircraft be allowed to compete during the following year but with the engine displacement reduced to .29 cubic inches. This is to be considered a temporary expedient so that those who now have racers won't have to relegate them to the trash can immediately. All in all, the design and testing of the Go-Go Fli has been an interesting and enlightening project.

Much of what has been learned with the present design will be applicable to the new and, hopefully, accepted rules. We haven't as yet figured out exactly what we will do with the current airplane, but believe that if it were stripped of the cheek cowls, canopy, landing gear, and with a smaller spinner, that it might very easily break the existing world R/C speed record, using the stock K&B 40 engine!



Author-builder Larry Rosenberg with 54" Kwiksilver.

## KWIKSILVER

(Continued from Page 26)

### Empennage:

Simplicity itself. A sandwich stab and sheet fin, rudder, and elevator. Once again, sand well. I went the nylon hinge and toothpick route and this seems to be quite adequate.

### Wing:

The wing, being basically a Falcon 56 wing kit, is quite easy and fast to build. **DO NOT ADD SHEETING TO THE WING; IT IS NOT NECESSARY AND ONLY ADDS WEIGHT.** This wing is quite strong and will take any maneuver that you can dream up and then some. The very heavy leading edge, and good hard spars, plus the fiber-glassed center section provide an adequately strong structure.

To begin with, cut out the ribs to fit the landing gear mounts as shown on the plans, then proceed to build both halves of the wing exactly as the kit plans show but do not add the landing gear mounting blocks or the tips yet. Now note the aileron cutout shown on the plans. Cut off the rear portion of the affected ribs and cut the trailing edge at the inboard end of the aileron with a razor saw. Next add the ¼" sheet and small gussets to the ribs at the aileron hinge line. Add the doubler to the full length rib at the inboard end of the aileron in order to keep the silk from pulling the rib in. Build up the ailerons separately. Now is a good time to install and/or plan your linkage for the ailerons. It is much easier to punch pushrod holes in the ribs while it is in two halves, than after it is assembled. After devising a suitable mounting scheme for your particular servo, the wing halves can be joined using the rock hard ¼ x 1 balsa spar joiners (trimmed to fit the spar slots closely). The leading and trailing edge splices are cut from scrap ½ ply. Let this assembly dry **COMPLETELY** before removing from the board. The landing gear blocks, center sheeting, servo mounts, etc., can be added now. Next, glue on the tips **BACKWARDS!!**

(Continued on Page 84)

## KWIKSILVER

(Continued from Page 83)

(They look better that way.) Now sand well, install all hardware and ailerons, a couple of coats of clear dope with light sandings in between, glass the centersection, and the structure is done. **Covering and Finishing:**

As you have probably determined by now, I am somewhat of a weight fanatic on my airplanes. This is especially true on the smaller airplanes as it takes very little increase in weight to really up the wing loading. As a result, I have my own finishing technique which I feel provides an adequate finish at minimum weight and cost.

To begin with, do not paper or silk anything but the wing. It just isn't necessary and really adds the weight. After gluing the stab and fin to the fuselage, you are ready to finish. **DO NOT CLEAR DOPE THE FIN AND RUDDER.** The soft ¼" sheet will surely warp if you clear dope it. Rather, try this.

Give the entire **WELL SANDED** fuselage and tail structure about 3 coats of balsa filler coat, sanding off all but what remains in the grain. Thus, very little weight is added. Next, spray on 2 coats of color. Now mask and add your trim. Do not forget to seal the edges of the masking tape with clear dope to prevent bleeding. After all of this is dry, spray on one coat of clear and hang it up for a couple of days. I think that you will find that you have an attractive, glossy finish with a minimum of fuss and weight.

The wing is wet silked and sealed up with about 4 coats of clear dope, brushed on. Now spray on 2 coats of color, add trim as on the fuselage, and again spray on a coat of clear dope. Your decals can be fuel proofed by using the film fixer solution squeegee from a roll of Polaroid film. After all is dry, add the main gear, brakes, wheels, etc.

Now you can drill your dowel holes in the fuselage, install the radio gear, engine, pushrods, etc. Balance the ship where shown, set your control surfaces in neutral and adjust to the travel shown on the plans.

### Trimming and Flying:

Nothing special here. Build it true and light, make a careful radio installation, and spend a little time feeling it out in the air before getting fancy. Trim it to fly flat with zero trim settings, as per usual practice. I think that you are in for a very pleasant surprise when you get this bird in the air.

Happy flying!