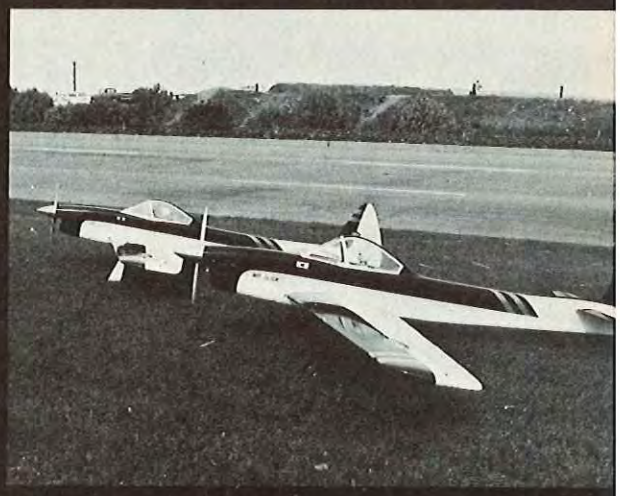
47783 FEBRUARY 1972 75¢

RC MODELER

THE WORLDS LEADING MAGAZINE FOR RADIO CONTROL ENTHUSIASTS

THIS MONTH

'Mr. Slick' is an out-of-the-rut competition pattern design by Vic Husak, one of the nations top designers. Featured on page 18 of this issue.



THIS MONTHS COVER

The Specialist 'V', a high-performance sailplane is one of this months featured articles.
Model is displayed by Mrs. Kevin Flynn.
Ektachrome by Kevin Flynn.
The Wayfarer is a realistic flying biplane for .40 to .60 engines. Ektachrome by Don Dewey.

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VOLUME 9 NUMBER 2

FEB. 1972

VIEWPOINT

BY KEN GALBREAITH

Model airplane pilots are probably the most unsafe, unprepared, and unconscious people in the air today.

That statement should at least get a bomb planted in my Ugly Stik when my back is turned. Before I am excommunicated from my club let me attempt to explain or justify that little gem of wisdom.

Two facts have brought me to this conclusion and, perhaps if I mention them, you will be able to see my logic behind these ideas. First; at our field, recently, a noted model airplane columnist was struck by an airplane in flight. The ship was attempting to recover from a spin and the pilot had gone beyond the abort point. Being extremely lucky, the columnist was only struck a glancing blow by the wing leading edge. Contemplate for a moment what a spinning prop and the weight of an airplane could do to the human face! In recounting the incident the columnist said he didn't realize the plane was that close and going to hit him until a split second before it happened. The reason being that he was looking straight up and had lost depth perception and sense of speed and direction due to lack of horizon for reference. Second fact; I am an Air Traffic Controller at the Army Primary Helicopter School. Here we take people who have never flown and turn them into the Helicopter Pilots who fly in Vietnam. Needless to say, some of our accidents are caused by the student losing visual reference to his surroundings. Now the common reference between these two facts is that both concern losing contact with what is happening in adjacent areas at any given time.

Let me encourage every modeler who can, to visit a control tower or air route traffic control center. Ask questions and try to grasp what is happening. It will stagger your senses when you realize these controllers are working so many aircraft of different types at the same time, and that they know where each one is and what it is doing. The best airline pilots will tell you quite frankly that they would not have that job for twice their present salary. Yet these pilots are usually the best trained, safest people flying. The pilots and controller have one thing in common. They are both aware and dedicated to what they are doing at the moment.

Which is not the case with most modelers while they are flying, preparing to fly, or helping someone else. If we could only apply a fraction of the awareness and determination these people take into every flight, we might never lose a model except for an occasional radio failure.

AWARENESS – get your head out of the cockpit! From the day a student pilot first starts, his instructor is pounding this fact home. I would guess most full-size mid-air collisions are the direct result of someone not seeing in time. At the speeds our models fly, this rate of closure is so fast you must take evasive action before it is actually necessary. In order to do this you must pre-plan. Controllers and pilots never "play it by ear" on purpose. The operation follows a basic, pre-planned route and the variables are fed in as they occur, never forgetting the original intent. Reduced to workable language, this simply means **always being ahead of the situation.** That's the reason for the pre-landing checklist in the airplane and a traffic pattern at the airport.

Since we can apply some of these concepts to models, it might be worthwhile to examine them. Models use the same air the full-size ships use.

Every flight starts with a pre-flight and flight plan. Get an airline pilot to describe this to you. I guarantee they don't "kick the tires and light the fires." Now – there sits your model in the pit area – go pre-flight it. Not just fill the tank and see if the control surfaces move in response to the transmitter. Start at the front and go tail-ward. Put pressure on the engine mounts to check for looseness. Also check carb screws and attachments. Check filters, fuel lines, and tank. Check the wing mounting and aileron horns, and clevis', and hinges. Now flip the bird over and check the nosegear brake, and the main gear for tightness and alignment. While the plane is on its back, remove the wing and check the pushrods and keepers. Check the servo, receiver, and battery mounting. Check all plug connections and put it back together. Flip it back over and fill the tank. Turn on and check all surfaces for movement and alignment. Now start up and check the high speed needle setting and idle. Check the radio again with the engine running. If, and only when, everything checks O.K. are you ready to fly.

It probably sounds like a lot of trouble but why not be professional about this? The airline pilot does it and it's not even his airplane!

Now – you're ready to fly. Taxi out and run it up again. If it still looks flyable, start your roll. This is where a lot of models are sent on one-way trips and big airplanes aren't. Seemingly, once a modeler firewalls the throttle his left hand becomes paralyzed. If the engine goes rich, lean, or the nose gear falls off, he gives full up and goes for the sky. This is **not** the sensible way. The full-size pilot will pull the power off and abort the instant something is not right. Only after the airplane is committed will he continue takeoff. We have an advantage here. A model, for practical purposes, is never committed until it starts climb-out. So what if you roll off the end and break a prop? Better that than a rich engine stalling the airplane with a snap roll back in!

This "Abort" business applies to the entire flight. Nobody with the desire to live continues to fly an airplane with a sick engine, or controls, when he is within sight of a runway. Yet I see modelers fight a rich, loading-up engine for a full tank when they could easily land, adjust the needle, and then enjoy the flight. No rule says you **have** to fly out the tank. That's why we pay for carbs on our engines. What sense does it make to fight a sick engine and doggy airplane when the ten dollar carburetor could solve the entire problem?

This ability to control engine speed is probably most useful on landings. 'Go-around' should be a standard maneuver for every modeler. Why risk a crash if you're three feet high, it's gusty, and one wing is a foot low? Why not just level the wings and firewall it? I know why! You hate for other flyers to think that you can't handle a little wind. Well, I know full-size pilots who had the same hang-up. You don't know what sheer

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Letters

A FINE GESTURE

Sir:

I think that you will be interested in the following letter.

Upon reading his letter, I knew that something would have to be done. Obviously, it is impossible to give a free radio to every youngster who would like to have one. There was just something about the letter and perhaps the timing that got to me. I had, just a few days before, talked to someone who had recently returned from an extensive stay in Malaysia. He told me of the impossible situation that modelers from that part of the world are faced with. I will not go into detail at this time, but a good parallel would be a youngster of 14 from the slums, trying to get together enough money to buy a new car. Actually an impossible situation. This conversation was still fresh on my mind when this letter came.

How could I turn down a plea like this, simply stated, no attempt to "snow me", just a plaintive cry for help.

I talked this over with Bill Cannon and we could just imagine the pure joy that an R/C set would bring to him. There was just no other way. We had to send him a set. The enclosed photo is of the system he will receive. It is our new Cannon "Cinder Block" (not a brick).

Just thought that you might like to know that down deep, Bill and I are both old softies.

Best Regards,
Cannon Electronics, Inc.
Al Strickland
General Manager

Sir,

I am writting this letter to ask you if you could give me one mini-3 set. I have been interested in Radio Control since I was 10. I made one aeropalane model when I was 14. It was ready to fly but I dont have a Radio set to operate it. SO I begg you to give me one please. If you are giving one please address it to, Zainal Abidin b Ismail, Serendah Boys' Home, Serendah, Selangor, Malaysia. I could not buy one because it is too expensive. For example 1 U.S. Dollar equals to 3 dollars our money. Again I begg you please give me one. If you are giving

one please write Donation on the parcel card. Or if not I will be tax.

yours sincerely,
Zainal Abidin

FROM EASTERN AIRLINES

Sir:

I am writing in reply to Don Gutridge's article "Flying With Your Model" in the August 1971 RCM.

I work for Eastern Airlines and to see what they had to offer for modelers and their models I wrote to their department called Feedback for employees, and I received a reply from the office of the Division Vice President of Cargo Sales and Service by John W. Kersey.

This is what he had to say:

"I understand the disappointment of a hobbyist when he arrives at a meet to find his model plane missing. I believe we have United beat in the service they offer."

"Eastern offers two services which will meet the needs of the model airplane hobbyists:

1. Committed To Ride (CTR) air freight, which allows the customer to call the Eastern Air Freight phone number and reserve space on a specific flight for his model. Our only requirement is that it be properly packaged and tendered to our cargo terminal at least two (2) hours before flight time.

2. Personal Air Freight, which can be handled at the ticket counter when the customer checks in for his flight. The weight limit is 85 pounds per piece and a maximum of 200 pounds per customer. The rate is the regular air freight charge between the regular air freight charge per shipment of $10.00, or the charge for 50 pounds, whichever is higher.

"I appreciate your interest in obtaining this business for Eastern and I hope the above information will assist you in getting model airplane hobbyists on Eastern."

As you can see by this answer that United isn't the only one that is trying to help the modeler in this problem.

I have just started in RC modeling and am in the process of joining Broward County Model Association but I can understand the problems that a modeler can meet trying to transport his models though I haven't had to transport any, as yet.

If you would like to print this letter, I would appreciate it if you would inform other modelers about

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Feedback

RADIO CONTROL ACTIVITY AND NEWS BRIEFS

AMA SAFETY ARTICLE

AMA leaders met in New York City with government representatives in response to news stories concerning a reported near collision between a model plane and a jet airliner within the landing approach zone to JFK International airport on Sunday October 3. The meeting was requested by AMA members who were disturbed over the nature of the reporting and its potential harm to model aviation activities. In attendance were representatives from the Federal Aviation Administration, the U.S. Naval Air Station, the U.S. Coast Guard, the New York City Police Department, AMA national and local club officers.

Following considerable discussion concerning the report which led to the news stories it was agreed that although model aviation activities have had an excellent safety record to date additional steps should be taken to help prevent a recurrence of such incidents. Specific proposals resulted from the discussion, with reference to model flying in a FAA Terminal Control Area (TCA) near large commercial airfields, as follows:

1. No unorganized model flying activity.
   a. Flying in designated areas only, with positive control provided.
   b. No insurance coverage for activity not under control.
   c. Flying under control of a safety officer.
2. No flying of a nature likely to result in flyaways or free flight; fail-safe operation desired.
3. Monitoring of tower control frequencies to be provided.
4. Maximum publicity to be used to inform all model flyers of the problem and danger.

It was emphasized in the meeting that the basic safety problem concerned model flying within newly established FAA zones called Terminal Control Areas. Within each TCA the FAA is responsible for operations of aircraft from ground level to several thousand feet up. In the New York City area, for example, the TCA for JFK extends for eight miles around the airport. This means that anything lifting off the ground within that area is of FAA concern. Merely limiting model flying operations to several hundred feet of altitude, which is adequate near airports in many areas of the country, is not in itself considered sufficiently safe for operations within the TCA. Such operations can be tolerated only if conducted in a manner and with sufficient control to prevent accidents at all altitudes within the TCA.

It was also brought out that organized type activity such as that conducted by AMA chartered clubs would minimize the problem, if a safety or control officer was provided to be responsible for operations in a manner that could stop or prevent flying in the vicinity of full scale aircraft. The FAA and AMA officials present agreed that a major concern was any lone flyer operating outside of group control.

The need for group activity in TCA situations was stressed by the basic FAA requirements for complete knowledge and control of all flying within the zone of responsibility. Since direct control of model flying was considered to be impossible, in the opinion of the senior FAA official at the meeting, the next best situation would be to know where and how any model flying would be taking place and under whose responsibility.

It was generally agreed that the long range solution to the problem might be the establishment of officially recognized model flying sites within TCA jurisdiction with no model flying except at those sites. The police representative at the meeting pointed out that there was already a law which could be applied to eliminate any flying (model or otherwise) conducted in a dangerous manner and that it would be easy to interpret that law to mean any flying outside of designated areas.

It was also pointed out that while present FAA regulations do not clearly indicate what model flying is legal or illegal there would be no problem establishing this in a relatively short time if a compelling need was indicated. Specific regulations already exist for model rocket and kite flying. FAA regulation in itself, however, was not agreed to be needed or desired, so long as self-regulation by model flyers was felt to be effective.

Unorganized or undisciplined flying was repeatedly stressed as a basic problem, with the danger that one careless flyer could cause all model flying to suffer. The need, therefore, was seen to be for all flyers to get together and prevent irresponsible flying or flying which was not under control and knowledge of other flyers. As in the case of the incident reported the previous weekend a single flight with bad publicity had widespread effect on all model flying in the New York area.

The situation was obviously compounded by irresponsible news media which distorted the facts, but this was acknowledged to be a continuing problem not likely to be overcome. Both AMA and FAA oficials agreed that there was almost nothing that could be done to prevent such media reaction or bring about corrections to incorrect reporting – the media had proved to be unresponsive in the past and also in connection with the Oct. 3 incident.

With such a media situation the danger is that misguided public pressure could force government actions which otherwise might not be considered necessary. As in the case which resulted in this meeting the public impression was obviously one of near disaster, although the fact of the situation was that even if the model and the airliner had collided the liklihood of any catastrophe was extremely small. Regardless, the public reaction created by scare headlines and distorted reporting was too far developed to be overcome by retraction or restatement of earlier reports especially since there appeared to be little media interest in setting the record straight.

Aside from the fact of whether or not any real hazard exists concerning model flying in the vicinity of airports, it is clear that there are two problems which need prompt and vigorous action in order to prevent model flying activities from being curtailed due to emotional rather than factual considerations.

1. A major public relations effort is needed to change the image of model flying. The popular public image is one of toys being flown by boys rather than the true picture of miniature aircraft being flown by responsible adults.
2. Much more needs to be done to be sure that all model flying is conducted with maximum safety precautions, with particular regard for operations which might be in the vicinity of full scale aircraft.

The public relations need is two-fold: within the aviation community and to the general public. Unfortunately, most aviation people are unaware of the nature of current miniature aircraft activities. FAA people, for example, are generally NOT knowledgeable concerning such activities; the same goes for airline personnel. This is so despite the fact that some of our model flyers are FAA and airline employees.

As in the case of the government people involved in the meeting described, their attitude toward our activity changed upon meeting the model flyers and learning of the true nature of the sport and hobby. The change then resulted in constructive discussion of mutual problems and proposed solutions. Particularly effective was explanation of the fact that many people were professionals in aviation and in the general business community: airline pilots, engineers, lawyers, dentists, etc. The same appreciation is needed by the general public if the negative aspects of media reporting are to be minimized.

Also helpful would be greater appreciation of the benefits of miniature aviation activity: educational, recreational, and inspirational (youth leadership). The activity's positive contribution as a deterrent to juvenile deliquency is well known by those involved but not by others. The same is generally true of the educational benefits concerning creative and scientific teaching, leading to careers in technological fields. But the greatest impact can probably be made concerning the recreational aspects, to the effect that many pilots, technicians, engineers, and executives find model flying to be a great release from the daily job pressures, enabling them to better cope with the problems involved.

In the end, however, all the positive aspects of the activity can be ignored if maximum safety of operations is neglected. Here again the possiblility of careless or irresponsible actions by a few needs to be minimized by the concerted efforts of the rest. Where such actions have been tolerated in the past, they need to be eliminated in the future, starting NOW.

This is not mere sermonizing. It is the handwriting on the wall which says that another near collision can result in drastic reaction. We have, in effect, been given a warning to prove that self-regulation can prevent recurrences. Failure to do that can be expected to result in regulation being imposed on us from outside.

Our greatest danger at present is a tendency toward tolerance of unsafe flying even though we condemn it and have various rules against it. This refers to club activity in which a few people habitually ignore club safety regulations and club officers are reluctant to be tough about enforcement. It also refers to individuals who have taken chances while flying, knowing that equipment failure could result in dangerous situations.

The warning of the N.Y. meeting is that the time is now to end our tolerance of the past and to organize our flying activity more effectively to minimize the chances of another incident which could bring on intolerant regulation. The proposals produced by the N.Y. meeting are therefore worth closer study.

The point concerning only organized flying in Terminal Control Areas is related to the need for any model flying to be known to FAA Traffic Controllers. This

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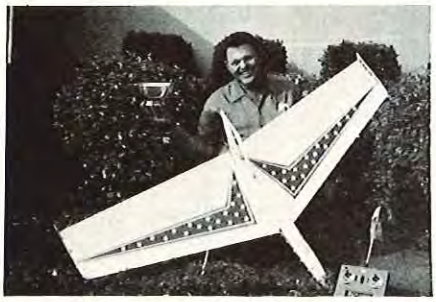
KEN WILLARD



Ron Neal and his winning Gryphon wing.

Slope racing! What an exciting event! And dangerous, too . . . at least under the present rules, which I hope will be changed before the next races come up around here, anyway. Let me tell you why, as I sit here, nursing a badly sprained back.

On Sunday, November 7th, the North Bay Soaring Society hosted the Northern California Sailplane Sprints at Thornton Beach in San Francisco. The races were to be held both Saturday and Sunday, but on Saturday the wind was zilch – in fact, it was worse than zilch – it was about five miles an hour **down** the hill. But Sunday was a different story.

There was little wind early, but along about eleven in the morning it came up enough for the sailplanes to stay up, although marginally so. Anyway, the races were started.

I was in the second race, with three others. Along the way, about the fourth lap, the wind died, and we all landed on the beach. I asked if the race could be re-started. Nope, said the director. Okay, I says, then the race ain't over yet, and if we get zero points for not finishing, then, since there wasn't any time limit set, we had the right to get our planes off the beach, re-launch, and complete the course. Right? Well-l-l, I guess so.

While we were "discussing" the pro's and con's, some fellows had gone down to pick up the planes and were slowly coming back up the hill. As soon as the decision was made that, yes, you could re-launch, I collared one of my young friends and said, "Hey! Barrel down and get my plane back to me as fast as you can!" And he did. Meanwhile I had run down along the hill as far as I figured I could go, launch and still stay up to complete the course. He brought the model to me, and I tossed it in the air. My pit man, Bob Andris, saw what was going on, and signalled to me from the top of the hill when I passed the far pylon (I couldn't see it from where I was) and I turned the model back, rounded the near pylon, and completed the race. But one other contestant, Paul Christian, had retrieved his model sooner and done the same thing. So he won. Well, he should have, anyway; he was in first place when we hit the beach.

But by the time I got back to the top of the hill, after all the running up and down, I was puffing pretty hard. But happy. Even if it was a little ridiculous, if that was the way it was going to be, then I was gonna' compete. And that led to my downfall. Literally.

Later on, Bob Andris was racing and I was his pit man. We were about halfway through the race when he turned a little too close to the hill and dumped his plane. Since re-launches were permitted, I took off down that hill like a jack rabbit – only not quite so sure footed, if you know what I mean. My head got going faster than my feet, and when I put on the brakes I doggone near landed right on top of Bob's racer – which incidentally was right on the edge of the cliff. Had I gone a step further you'd be reading my obituary!

Sure it was silly, thoughtless, and dangerous. But in the heat and excitement of racing, who thinks about those things? Anyway, I picked up Bob's plane, we checked the controls, and when assured that everything was working, I launched it. What's more, Bob finished the race and scored points.

During the day, there were several other instances of planes scraping the hill and being re-launched. I don't know about the other fliers who raced down the hill, but when I got home I could hardly walk. Seems like when I made that sudden stop, I really wrenched my back.

So that's why I say that slope racing is not only exciting – it's dangerous. And there's an added danger. You could be down there, retrieving a racer for re-launch in the middle of a race, and one of the speedsters could come whizzing by and knock your block off!

To eliminate this danger element in slope racing, the re-launch provision should be eliminated, except in those instances where the wind dies during a race and nobody finishes. Then, the re-launch should be on the basis of a new start for the entire race. But in those instances where some don't make it, but one plane is able to finish, then that's the race. After all, that's the way it is if there's a midair, right?

Incidentally, the starting system developed by the North Bay group

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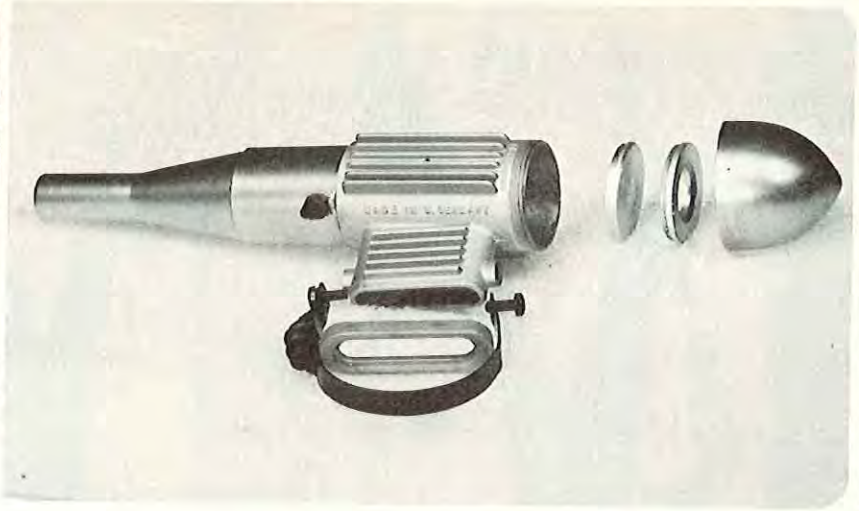
Monty Grove's Loughead (Lockeed) S-4 scale model.

engine clinic

By Clarence Lee



Early this past summer Frank Kavan was in Los Angeles on a business trip and I had the occasion to visit with him and see a preview of new products he has intentions of marketing. The majority of R/C modelers are very familiar with the Kavan carburetor and line of accessories. New items that were shown to me included his .60 displacement engine that features a completely new type of induction along with Schnuerle type porting, a miniature fuel pump that meters the amount of fuel delivered to the carburetor, a hand held electric starter considerably smaller than anything presently on the market, and a muffler that, with the use of various adapters, could be used on a variety of different engine makes. Kavan promised us pre-production samples of his new items and we have been looking forward to receiving them, our main interest being in the new engine and fuel pump. However, the first item we received is the new muffler on which we will report this month.

The Kavan muffler is an extremely well made die-cast unit that features a removable nose cone. The muffler comes equipped with two optional disc inserts that, in turn, determine the noise level of the muffler. One disc is solid and, when installed, makes the muffler a regular expansion chamber type and the quietest. The other disc has a large hole in the center with a slight venturi shape. The removable nose cone is actually larger in diameter than the body of the muffler and has air vents where it joins the body. By using the insert disc with the hole, the exhaust gasses can also exit through the nose cone vents, thus increasing the outlet area of the muffler while reducing back pressure. This results in less power loss but at the expense of more noise. Only one basic muffler is necessary for the .60 size engines. By using a series of adapters the muffler will fit many different makes of engines. I imagine sizes for the smaller displacement engines will be available shortly.

We tested the muffler on a Veco .61 using an 11/7¾ Top Flite propeller and Supersonic 500 fuel. Without a muffler the engine turned 11,800 rpm. With the muffler and the venturi disc installed the engine turned 11,750. A drop of 50 rpm is insignificant as changes in temperature and humidity can cause more of a loss or increase than this. With the solid disc installed the engine turned 11,600 rpm for a drop of 200 rpm which is still a very small loss. I would consider anything up to 300 to 400 rpm acceptable. A loss of 500 or more would be undesirable.

The real surprise came when making sound level checks with a decibel meter. Measurements were taken 15 feet from the exhaust side of the engine. We do this as you will receive a higher db reading here than either in front or to the rear of the engine. The meter registered 100 to 101 db with either the solid disc or the venturi disc installed. However, in the air, the solid disc was obviously the quieter of the two. This certainly indicates that a decibel meter reading may not be a conclusive method of determining a mufflers silencing ability. I have wondered about this in the past when checking two mufflers of different makes that had identical noise level readings, and yet one would appear to be quieter in the air. Testing the Kavan muffler has substantiated these findings. Noise is a function of pressure waves. Evidentally, at close range, we are not only getting pressure waves from the exhaust, but from the propeller and whatever noise leaks through the muffler body. In the air you only hear the exhaust noise. Needless to say it is not the noise up close that we are as concerned with as the noise level at a few hundred feet or greater distance. This is what annoys the surrounding neighborhood. However, it is practically impossible to check noise level at a greater distance because of ordinary background noise. In a soundproof chamber there would be no problem, but at the flying field ordinary voice conversation a few feet from the decibel meter pick up will register as high as the airplane several hundred feet away. So, how do you go about determining the noise level and effectiveness of a muffler in the air? Any of you sound engineers out there that might have an answer or solution to this might let us know.

To sum up our findings of the Kavan muffler, with the venturi disc insert installed, we would have to rate this as one of the top mufflers we have tested. Only two other mufflers have shown no significant power loss, the Silence-Aire and Super Tigre flow-through models. However, both of these registered 105 db. The Kavan at 100 db is considerably quieter. This was also confirmed in the air. With the solid disc insert installed the Kavan muffler would be about equal with the best expansion chamber mufflers we have tested in the past. The Kavan muffler also features cast cooling fins

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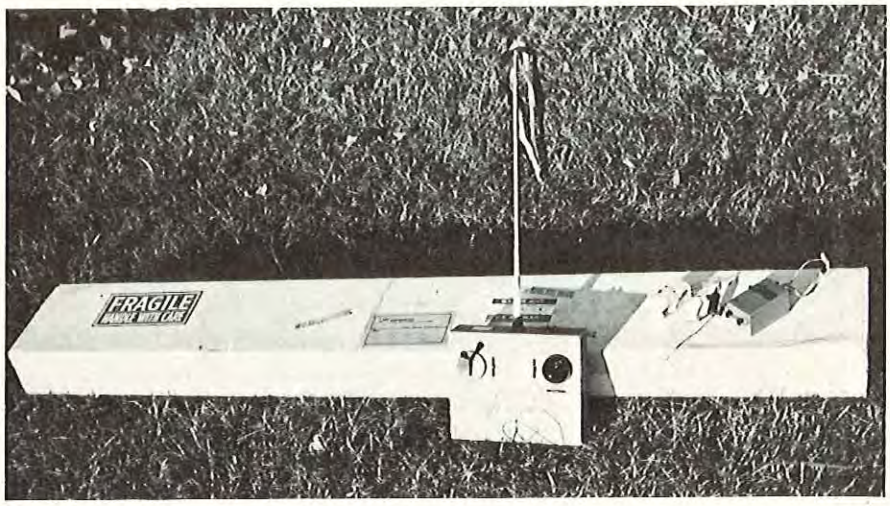
KITS & PIECES

Jim Simpson



Start with the Olympic 88 or 99 kit and EK LRB proportional system.

The Olympic 99 kitted by Airtronics - - - there are no superlatives which would adequately describe this fabulous airplane and the LRB (Little Red Brick) radio produced by EK Products Corporation. What a fabulous combination.

Let's go back to the beginning and tell it like it was. Shortly before my sojourn to the Glider Nats (RCM Oct. '71) I received a prototype of the Olympic kit. The designer, Lee Renaud, sent a note of apology for the "blue line" plans, no instructions and so forth. It was wasted effort because when I opened the box I could plainly see that here was a vastly superior kit. I built this sailplane with great ease, went straight to the flying field where I flew it with great ease, then called the pseudo editor of this disguised racing sheet and raved, and raved, and raved about it.

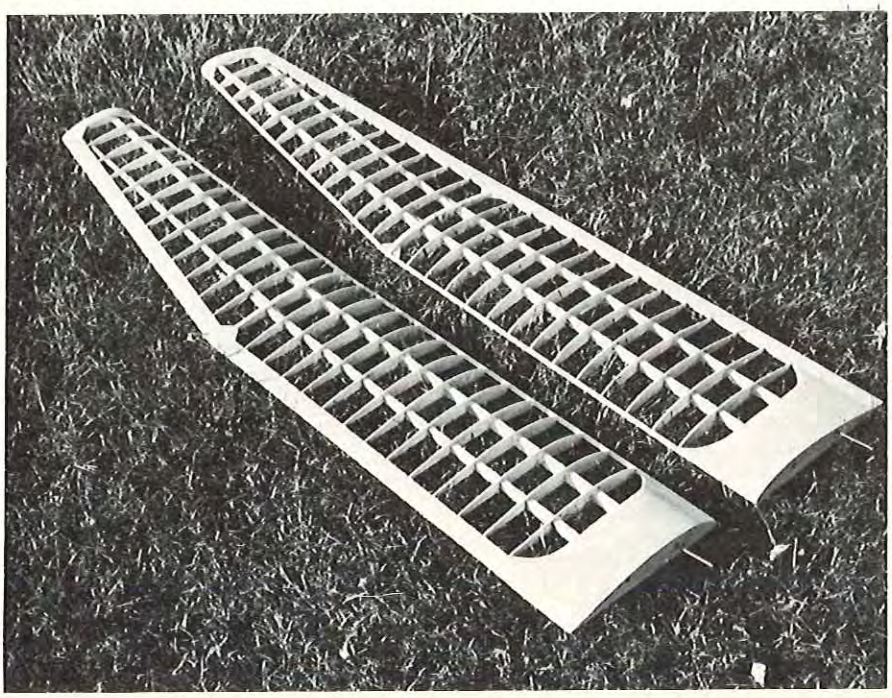
The result came in the mail a few days later in the form of a production run kit of the Olympic. Being a real fair minded person I felt it would be quite unfair to have all the fun myself, so I bribed my friend (a newcomer to R/C) Steve Wood, into building this one. He had hardly left till he was back with it, so this column will combine our views. As a result of the good publicity this plane has received there are about 10 or 12 Olympics here in the Omaha area now. I have had everyone on the flying field fly mine (this includes wives, girlfriends, moms, and dads of RC'ers as well as the RC'ers themselves) and the Olympic has won them over with its own merit.

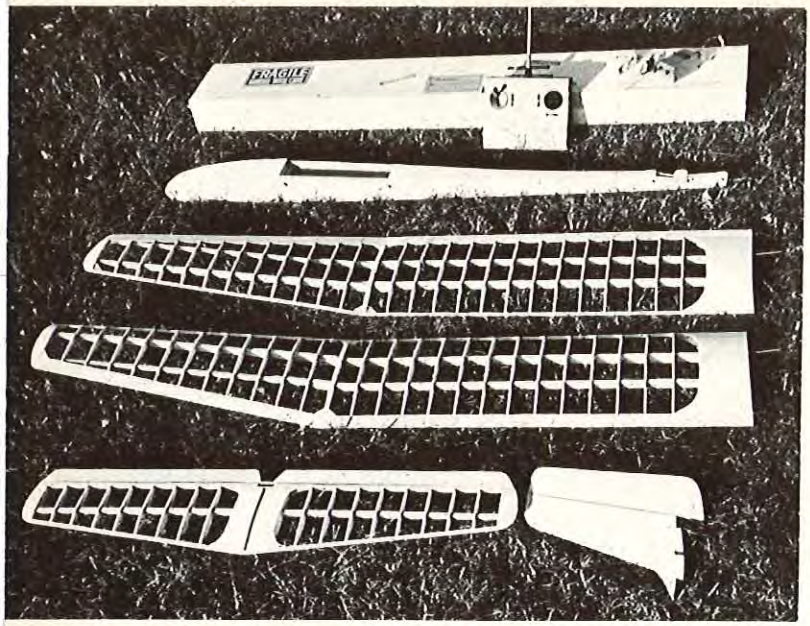
Not long after this occurred I had an opportunity to go to LA and gape in awe at the incredible efficiency of our editor, Pat Crews and her staff – all being able to get the magazine out on time and maintain order while having to cope with the undisciplined orangutang you and I know as Dewey (really the wastebasket emptier!). Anyhow, while there, I enjoyed a short visit with Lee and his wife and had a firsthand opportunity to observe part of what goes into the making of this wonderful kit. Friends, and fellow RC'ers, I'm here to tell you things are looking up! These people have joined the manufacturing ranks on a very high plane. Don't take my word for it, go see for yourself – straightaway to the dealer and ask to see an Olympic kit. Open the box and examine the contents. Imagine the work that goes into producing such a superb kit. Don't forget to thank the Renauds for making it possible and I'm sure the dealer will thank them too because quality like this comes so seldom that it sells itself.

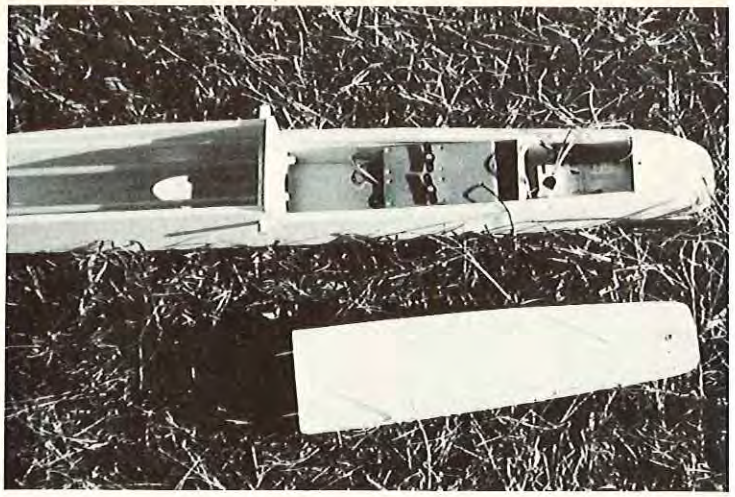
For those of you who are reading this article for interest and don't have a "rig" yet you can buy an LRB for $119.95 and an Olympic for $29.95 – your choice of finish or covering and be in the air as a successful pilot! No hidden extras.

When you get home and open your Olympic box you will find it includes everything except covering and glue. This means no annoying additional trips to the hobby shop for such things as pushrods, horns, towhooks, skids, hardware (every necessary bolt, nut or

Next, build the wings (no ailerons, linkage, etc.).







LEFT: Here's the Olympic 99 with all parts ready to cover. ABOVE: The EK LRB fits in the radio compartment with room to spare.

screw is provided) and even the rubber bands are included!

The pushrods are the new "goldenrod" flexible nylon (tube within a tube) type and you've got to use them just once to be able to appreciate them.

To build the fuselage you simply glue the spruce doubler strip on each perfectly cut side, glue the ply to balsa bottom in place, then add all four formers, noseblock and sides in that order. Slide the outer tubes of "goldenrod" through the pre-drilled holes, glue in place with contact cement, add the top planking, crosspieces, stab rest nose block (also pre-cut) and dowels and presto – fuselage complete! I suggest that if you plan to use Solarfilm or a like product don't glue in the dowels and stab rest until after covering.

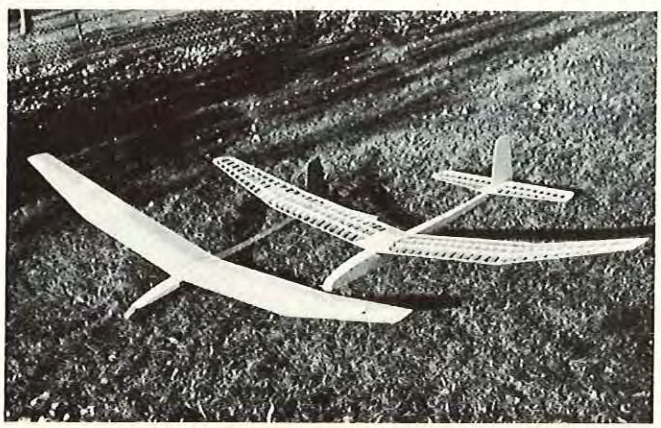
The rudder needs only to have the edges rounded. The stab is built by first placing the four ¼" square jig strips as shown on the plans, slide the ribs onto the spar in proper order after you've tapered it at the tips, align them, then glue and pin in place. Add the leading edge, trailing edge, and tips in that order. While it is drying, add the spruce capstrips to the wing spars as shown. When dry, remove the stab, add center section planking and sand the leading edge and tips.

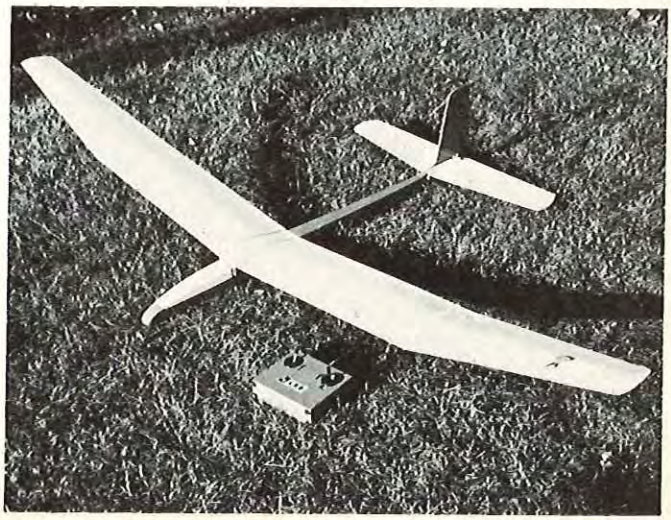
The wing construction is really self explanatory! Place the spar shims in place as shown on the plans. Locate the spars, add ribs, trailing edge and leading edge in that order. Glue it as you go. Do this four times (4 wing panels) and, if your timing and sequence is right, you can block up the tips and build in the polyhedral as shown on the plans. One note we'll add here – when epoxying the tubes onto the main spars wrap the assembly with strong thread. After you are satisfied with the anti-dihedral fit, add the planking and sand the wing for covering.

Cover the plane with your choice of materials following the manufacturers instructions, then assemble the fuselage, wing and tail. We used the EK Little Red Brick, so place the battery as far forward as possible, the radio unit likewise, then check the balance. The name of the game is balance as shown on the plans. Small pieces of foam will secure the battery and four wood screws into two soft pine rails will secure and shock mount the receivers – yes, I know there's no vibration in sailplanes, but you should see the landings (impacts) Dewey makes!

With the balance exactly as shown on the plans, and the towhook likewise, and if there are no warps, you're in for a fabulous flight whether by winch, Hi-Start, or slope launch. So have fun and try not to sneer quite so noticeably when you look at a kit of lesser quality! □

BELOW: Twin Olympics, one covered, one in framework stage. RIGHT: Let's go flying!





HOW RADIO MANUFACTURERS COULD HELP ELIMINATE

TRANSMITTER INTERFERENCE

FOR SPORT FLIERS AND DURING CONTESTS AT THE CLUB FIELD

Since transmitter interference remains a continuing problem for sport fliers and during internal contests at the club field, the following is a proposed solution to transmitter interference under these conditions.

PRESENT SOLUTIONS

1. Transmitter impoundment is used at major contests and is effective. Most of us fly 99% of the time under other circumstances. Impoundment requires a restricted area and one or more individuals to keep track of equipment and channel usage. This is not practical for sport flying and club events.
2. Frequency clothespins or pennants, etc., are removed from a central rack authorizing a single individual to use a specific frequency. This is not foolproof since it does not keep unauthorized transmitters off the air. Every club has had experiences where a transmitter has been left on after returning the clothespin to the rack. Individuals are not infallible!

PROPOSED SOLUTION

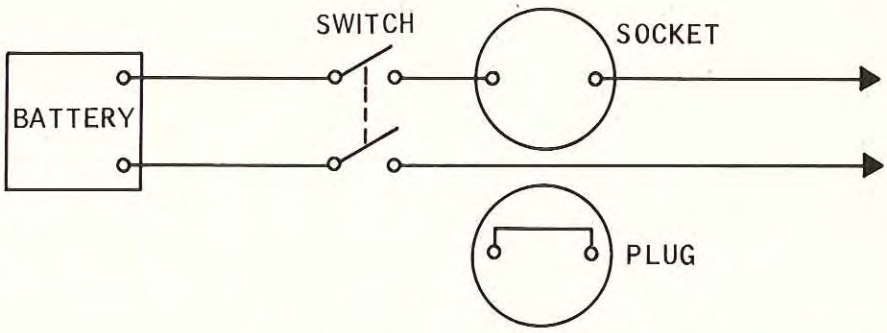
(With the co-operation of R/C equipment manufacturers with respect to warranties and standardization, the local club interference problem can be solved.)

It is proposed that all transmitters incorporate in series with the power switch a six pin socket whose pins are wired per the following chart according to frequency. A color coded plug is furnished whose pins are wired in the same manner. Plug is removable externally. Removing plug positively shuts off transmitter power by breaking the battery connection – see sketch for details.

At the field, owner's plugs are removed from all transmitters and place in storage box. One plug per channel is made available for flight line use from the club's set of plugs. There is no chance for error.

Cost of this modification is $1.00 per transmitter for socket and plug and $7.50 for each set of club plugs. Amphenol 91-MPM6L plugs and 78-PCG6 sockets list for 87 cents for the set. □

SKETCH OF CIRCUIT



It would take the cooperation of R/C Equipment manufacturers with respect to warranties and standardization to solve the local club interference problem.

BY WILLIAM METCALF

WIRING CHART

PLUG & SOCKET PIN ASSIGNMENTS

FREQUENCY	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6
1. 26.995	C	C	–	–	–	–
2. 27.045	C	–	C	–	–	–
3. 27.095	C	–	–	C	–	–
4. 27.145	C	–	–	–	C	–
5. 27.195	C	–	–	–	–	C
6. 53.100	–	C	C	–	–	–
7. 53.200	–	C	–	C	–	–
8. 53.300	–	C	–	–	C	–
9. 53.400	–	C	–	–	–	C
10. 53.500	–	–	C	C	–	–
11. 72.080	–	–	C	–	C	–
12. 72.240	–	–	C	–	–	C
13. 72.400	–	–	–	C	C	–
14. 72.960	–	–	–	C	–	C
15. 75.640	–	–	–	–	C	C

C = CONNECTION

MR. SLICK

BY VIC HUSAK

PHOTOS BY CHUCK KANAULE

For a number of years now, multi pattern ships have been taking on a sameness of design that is so predictable it appears that R/C multi design is in a rut. "Mr. Slick" is an effort to break away from the "run-of-the-mill" multi design, in at least a couple of areas. Trike gears are nice, but for sheer pleasure, watch a tail dragger during a nice takeoff and landing. It's not so cut and dried a procedure, requiring a little more finesse on the part of the pilot.

Also, I've always been a strong advocate of the larger-than-usual multi ship. They may fly a little slower, but visually they look better flying through the maneuvers and are easier to follow. However, with the new breed of .60's such as Webra Black Heads, Veco .71's, H.P.'s, O.S. Max, Enyas, etc., that give such tremendous power output swinging props like 11-8 and 12-6 wide blades, the large multi ship need not suffer from slowness. One of my "Mr. Slick" ships mounts a Webra and has retracts in it, and this bird is no turtle! It can honk along almost as fast as some of the smaller .60 powered bombs seen screaming around these days. Yet, the maneuvering capabilities of this big bird are really great.

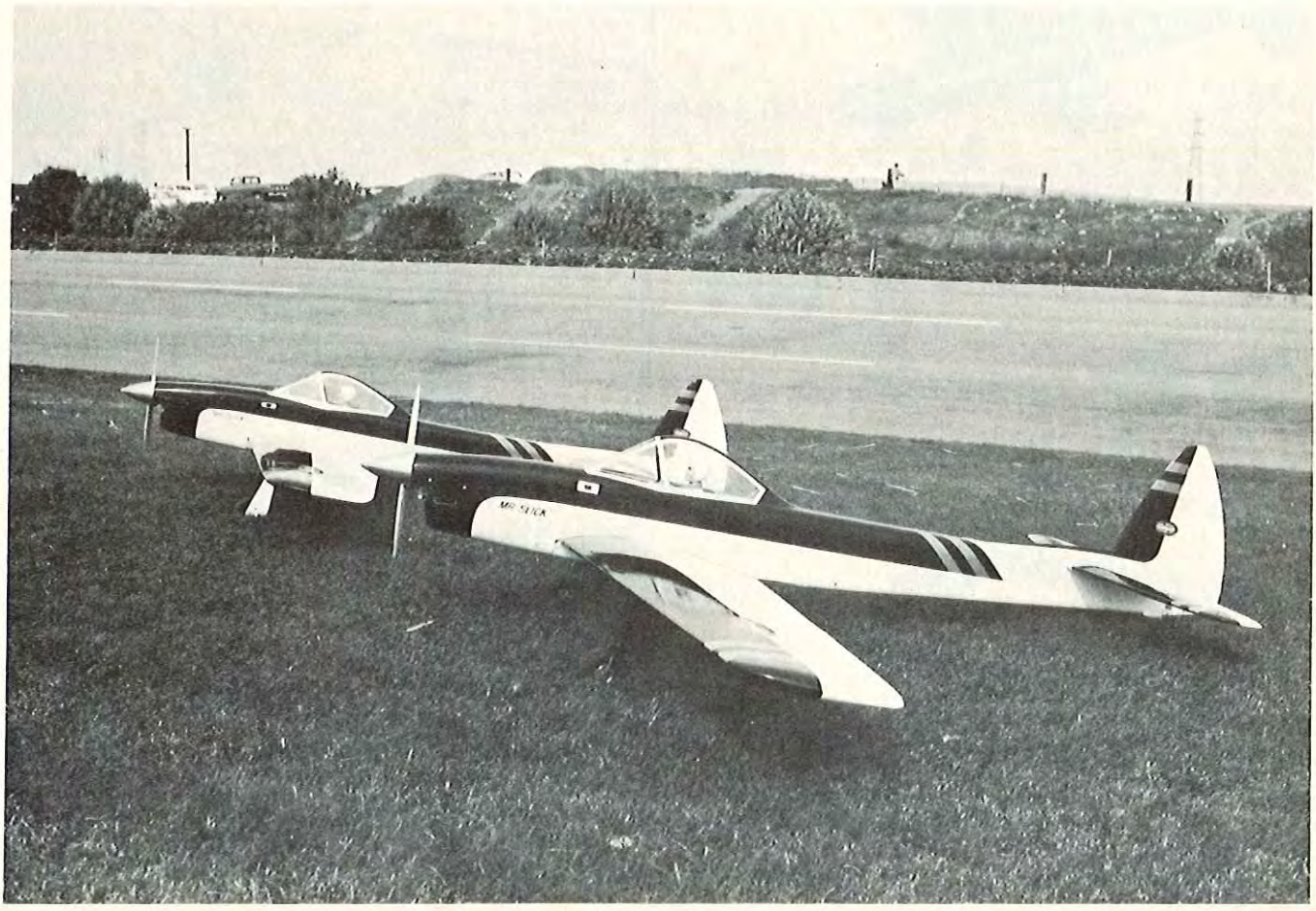
Another area I've tried to work into with "Mr. Slick" is that of a more scale-like appearance. Comments about the looks of this bird are nothing but good. Admittedly, it resembles a lot of different full-size aircraft, and yet, no one in particular.

So, give your multi stunt ship aspirations a shot in the arm, and fly "Mr. Slick." It will convince you that this is the welcome change you've been looking for.

A couple of items of information: don't be afraid to use a 12" diameter prop. As span goes up, prop diameter should increase to keep engine-to-aircraft efficiency high. Additionally, if you'd like to install a set of retracts, go right ahead. This ship can handle the additional weight with no performance penalties.

CONSTRUCTION OF THE FUSELAGE

Twin 'Mr. Slicks' . . . . both by Vic Husak. Ship in foreground has Orbit radio, Veco .61, CAS retracts. Model in background has PCS radio, Webra .61 power.



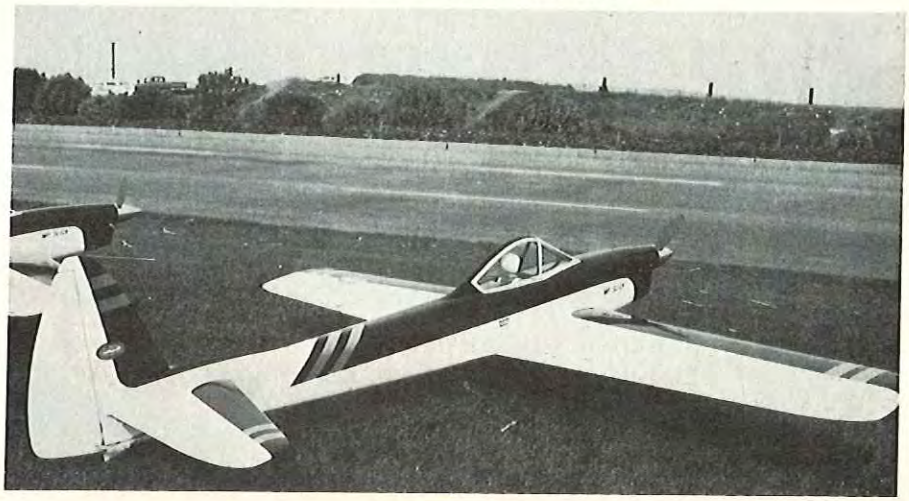
Since the fuselage sides are longer than usual, splicing of two 1/8" x 6" x 36" sheets is required. The plan shows the outlines of the sides. Make up both sides at the same time, being sure that one is laid out as the right side, and the other as the left side. Add the longerons along the top and at the bottom of the sides; then cement F-6 in place along the bottom of the sides. Leave 3/16" gaps between F-6 and the front and rear lower longerons. (These gaps will be taken up by F-5 and F-7 after fuselage sides are joined). Now, cut out the 1/16" x 4" doublers D-1 through D-6. Their shapes can be taken right off the plan. Cement the doublers in place, add the splice doubler and the 1/4" x 1/2" braces. Cement F-3 and F-4 to right side, making sure they are perpendicular to the side; then, carefully locate and cement the left side on them squarely over the right side. Be sure top and bottom edges of the sides are aligned properly. Taper the upper and lower longerons at the rear of the sides so that when the back ends are brought together, the longerons match nicely and yet allow a 3/8" gap between the sides behind the ends of the longerons. (This gap to be taken up by the 3/8" x 1/2" rudder post later). Join the longerons at the back end, making certain the structure is dead true, then epoxy F-2 in place and add rear cross-braces. Now the nose block is added. The block should be 1/8" wider across the rear face than the front face. This tapers the sides of the block, when viewed from the top, so that when the front ends of the fuselage sides are brought to the block, a good match will be achieved.

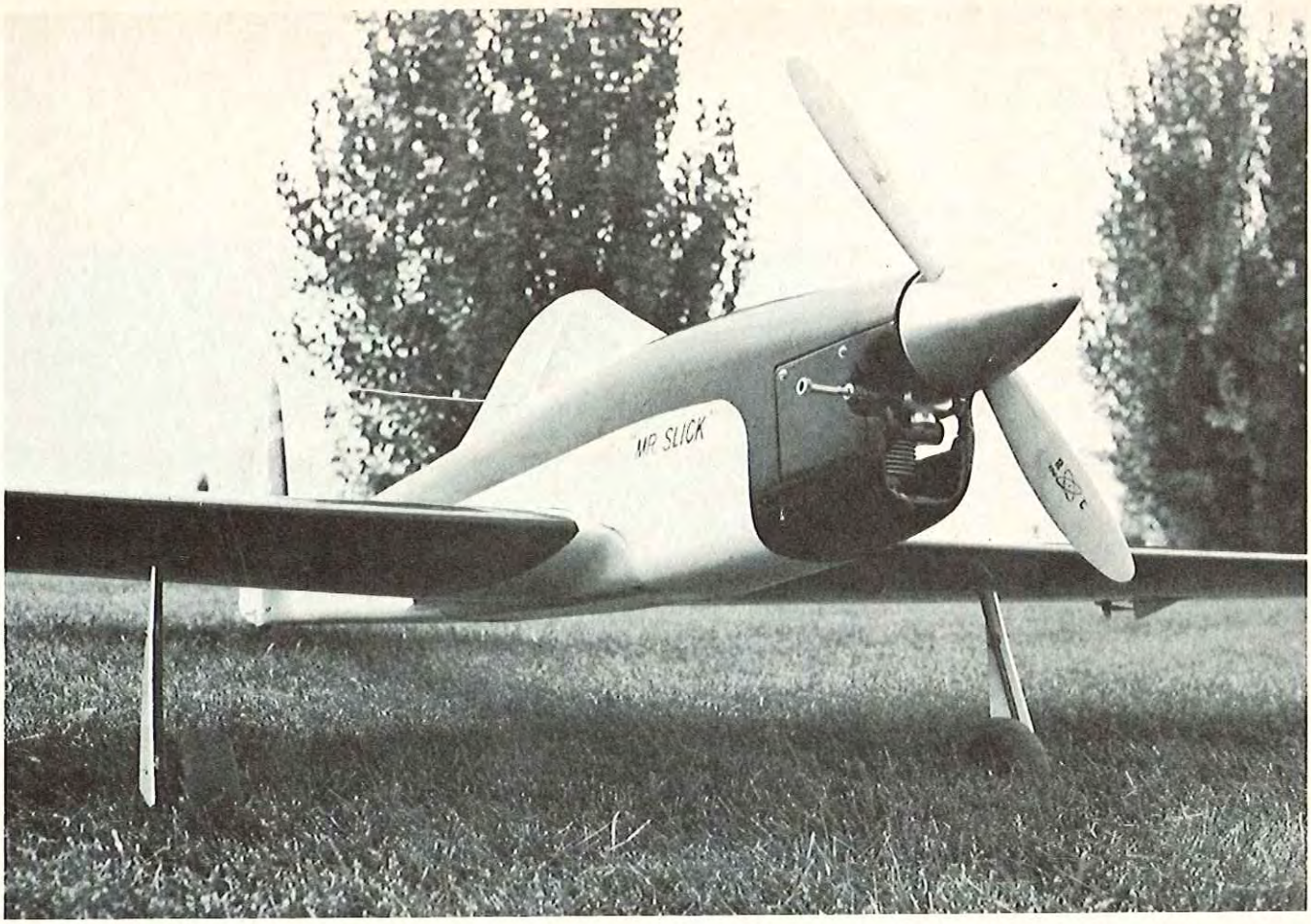
Next, add F-5 and F-7, the top and bottom 3/4" nose blocks, the 1/2" top sheet and 1/4" bottom sheet to complete the fuselage assembly. Carve, shape and sand the entire assembly to match the cross-sections shown on the plans. F-1 is cemented in place at the front of the nose block and the nose is shaped around it.

Draw on each side the wing chord outlines and the parting lines, as indicated on the plan. Carefully cut out the wing chord areas; then saw along the parting lines with a Zona Saw and lift out the bottom fuselage section. This section will later be cemented to the bottom of the wing. Hollow out the engine compartment and cut cowling on the parting lines shown. Cut out cockpit and add F-8. Make up and roughly shape canopy top assembly and cement in place on fuselage top

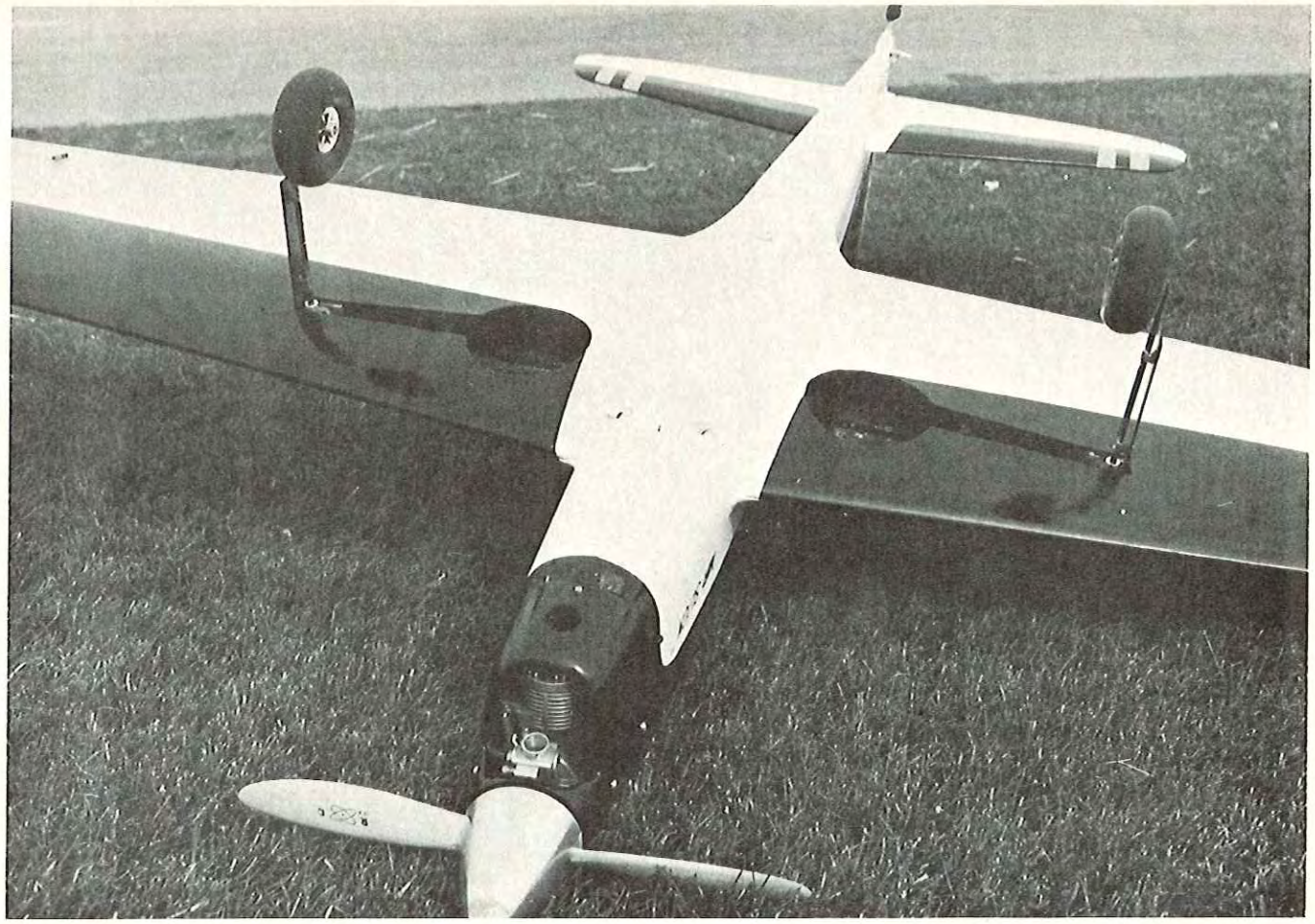
Author, Vic Husak, holds Mr. Slick prototype with retract gear. Ship in foreground has solid landing gear. A successful design effort to break away from 'run-of-the-mill' multi types.

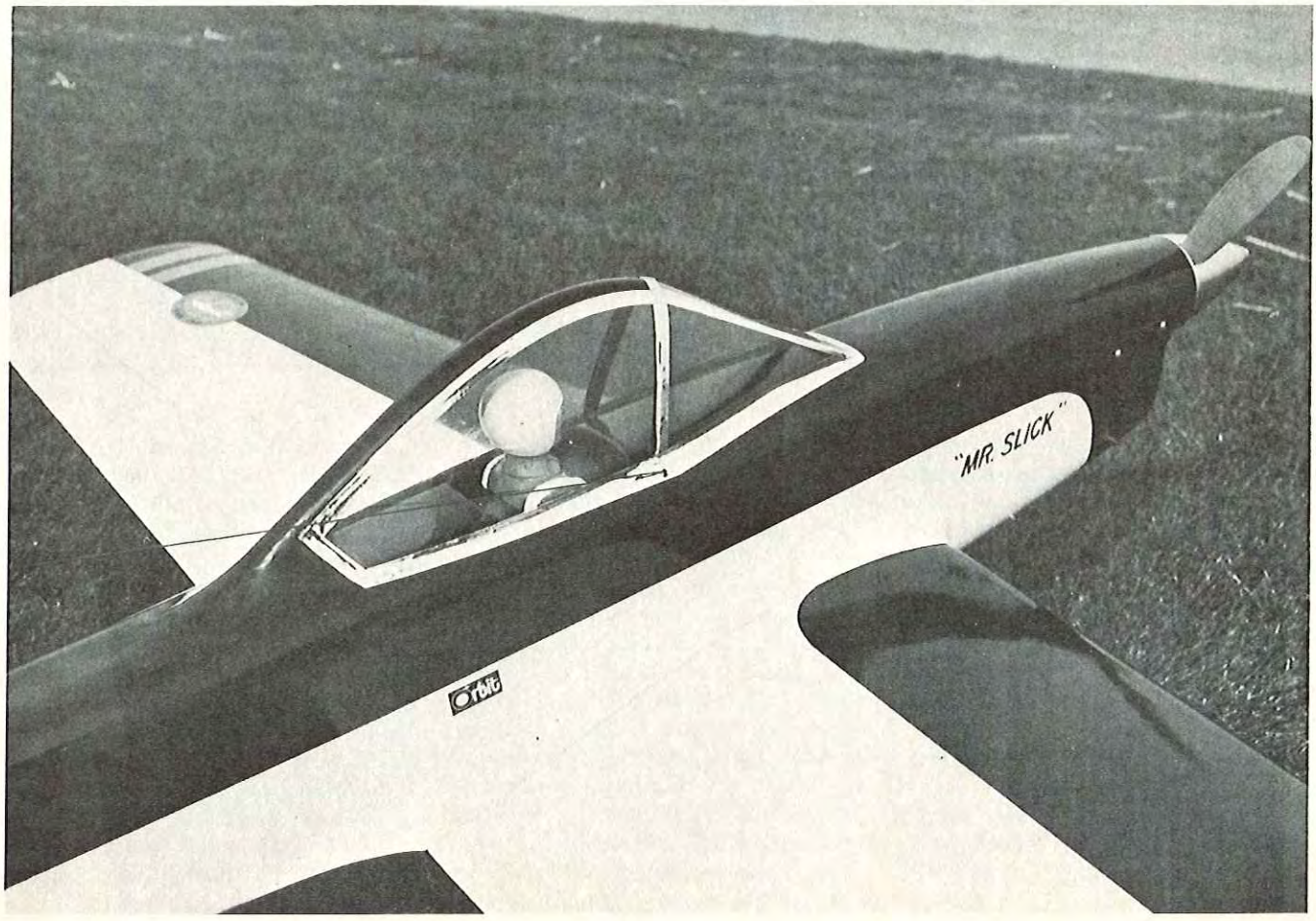
Three-quarter rear view of Mr. Slick. Note exceptionally long fuselage.

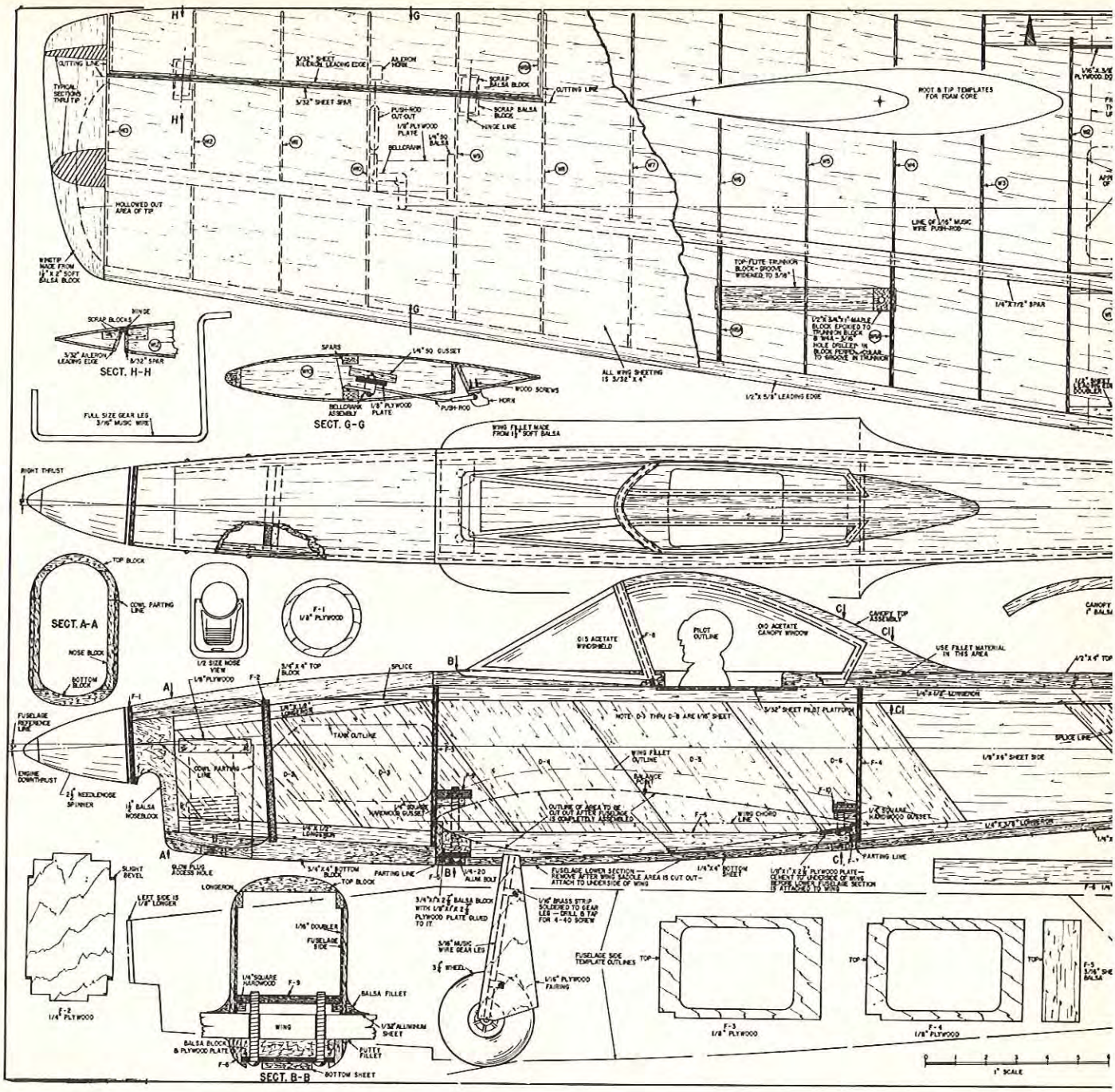



MR. SLICK


MR. SLICK




"MR. SLICK"



and against F-8. When dry, finish shaping and sand the canopy top, and add fillet material. Add the wing mounting bolt bearers F-7 and F-9, using plenty of epoxy glue around them and the 1/4" square hardwood gussets. Notch out the back end of the fuselage at the bottom, and add 3/8" hardwood block, which will mount the tailwheel bracket. Epoxy is, of course, used here.

CONSTRUCTION OF STABILIZER AND FIN-RUDDER

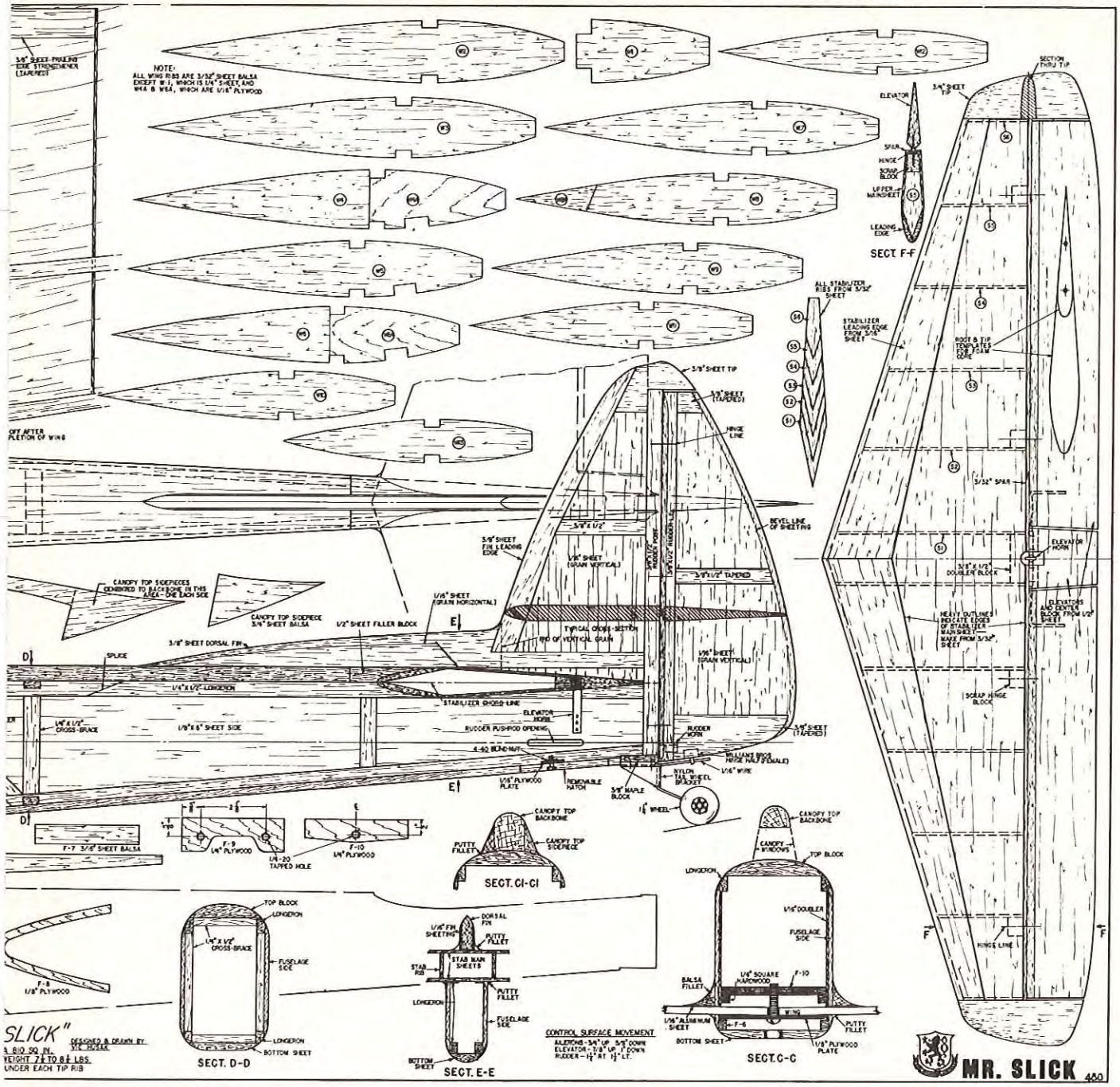
Stab construction is a very simple sheet and trapeziodal rib sandwich structure, which I used on the larger "King Altair" design a few years ago. It's very strong, simple, and light.

Cut out two identical 3/32" mainsheets, per the heavy outlines shown on the plans. Lay down one sheet, add ribs S-1 through S-6 and lay the second sheet on the ribs, in perfect alignment with the bottom sheet. When dry, add scrap hinge blocks, rear spar, upper and lower 3/16" sheet leading edge sheets, and the tips. Now, shape and sand the entire stabilizer assembly, and epoxy the elevator horn to the rear spar. Make up the elevators and center block, and cement the center block over the horn. The stab assembly is now cemented securely in place to the fuselge. Be sure alignment is correct. Then add the 1/2" sheet filler blocks. The fin is built per the plans and is sheeted with 1/16" sheet, with the grain running vertically to the point shown and horizontally from that point forward along the dorsal fin. Shape and sand entire fin-dorsal structure. The rudder post fits into the 3/8" notch at rear of fuselage. Check alignment carefully. The rudder is built up as shown on the plans to create an extremely light structure, or it can be made from 1/2" sheet.

CONSTRUCTION OF THE WING

The wing should be built in a jig for perfect trueness. Lay down 1/4" x 1/2" lower spars, add ribs W-1

PLANS AVAILABLE – SEE PAGE 104



through W-13, pinning and blocking up each rib as necessary to keep chord lines of the ribs parallel to the working surface. Add the top spar, spar doublers, then the leading edge. Next, add the trailing edge strengthener, shave down the top of the leading edge to blend with the rib contours, and add the top sheeting. When dry, remove the structure from the jig.

Add the landing gear trunion blocks and associated hardwood block, epoxying at all rib joints. Add the aileron horn plywood mountings and associated hardware between ribs W-9 and W-10. Shave down the bottom of the leading edge and sheet the underside of the wing, making sure that the panels are not twisted. Add the wing tips; then shape and sand the entire wing structure and fibreglass the center section. Next, mark off the cutting lines on each panel for the ailerons and cut them out. Add scrap hinge blocks to the main panels and cap exposed rib end areas with a 3/32" sheet spar.

The front of each aileron is trimmed off another 3/16", beveled as shown on plans, and the inboard end of each aileron is trimmed off 3/16". Then rib W-8A is added, scrap hinge blocks are cemented in, and front of the aileron is capped with 3/32" sheet.

Now the wing is fitted to its saddle in the fuselage, the wing fillet blocks are added, and the lower fuselage section is cemented to the bottom of the wing, while the wing is attached to the fuselage. Contact cement aluminum sheet to underside of fillets, then carve and shape fillets per the plans.

Finishing is left to your own tastes and methods - - - just keep it light. Mount the engine, locate servos, receiver, battery pack as to your liking. Completed model should balance at a point 50% back from the leading edge at root rib location.

Good Luck. □

One of the finest bipe's you'll ever fly - - - performs all the maneuvers in a realistic manner. Outstanding slow speed characteristics.

WAYFARER

REALISTIC PERFORMING SPORT BIPLANE FOR .40 TO .60 ENGINES

BY DON DEWEY

During the 1965 RCM Design Contest, we received a set of plans from a Dr. D.J. Gerner for a model that was later destined to become one of the all time favorites ever presented by R/C Modeler Magazine. Before presenting it for publication in the May 1966 issue, we constructed a prototype from the author's plans and virtually "flew the pants off of it." This model was the Hobo, a quickly built and easy-to-fly sport biplane for reeds or 3 channels of the new proportional systems.

The Hobo was an almost immediate success. It was a fun-type biplane that was extremely easy to fly, yet was rugged enough to withstand any type of rough field takeoffs and landings. Its slow speed characteristics were virtually phenomenal and it could be landed at a speed far slower than the normal stalling speed of most aircraft of its type. During the next two or three years, we wore out one Hobo and built at least two more, all of which were flown for many, many hours. All of the original Hobo prototypes required no takeoff corrections at all, and after exploring the sky at your leisure with a stable and easy to fly biplane and, as the author put it, "when you got tired of chasing the wind and playing tag with the birds, you could throttle back and come in for an effortless landing that would make the hot shots envious."

As proportional systems became more and more reliable, not to mention smaller and lighter in weight, we used the Hobo as a test bed for each of the new systems that came our way. The original prototype by the author weighed six pounds plus with the older and larger systems and, as the micro miniature proportional system became available to us, the weight of the plane lessened and we noticed an even greater increase in its performance characteristics. After a couple of years of flying with various radio systems, I decided to use the original Hobo's unique construction features in a new design that would retain its excellent handling capabilities and low speed characteristics while increasing its performance with the addition of ailerons and a reduction in the overall weight.

Thus, the Wayfarer was born. This model proved to be even more than we had anticipated when I started sketching the plans. In fact, the prototype is one of the best flying sport biplanes that we have seen at RCM. With 800 sq. inches of wing area and an all-up weight of five pounds with the Kraft Series Seventy-One proportional system, it excels in the performance category with anything from a .40 to .60 engine. We used an OS Max H.40P engine on the prototype and found the airplane capable of all standard maneuvers while retaining the original and exceptional slow speed characteristics. The overall wing loading is in the 15 to 16 ounce per square foot range which added considerably to those slow speed characteristics. Yet, under full power, the Wayfarer will climb out with the best of them and perform virtually all of the vertical maneuvers

with ease.

While I, personally, have a particular affinity for biplanes, there is something about this particular model that gives you a thrill every time you see it in flight. It is extremely easy to fly, and anyone with a few hours of proportional time on an intermediate or advanced trainer will have no difficulty in handling the Wayfarer. Don't hesitate to fly it from small, rough fields since it can be slowed down to a virtual walk for a landing and can take almost any type of punishment a rough field can hand out. With a .40 it flies at almost scale-like speeds and is quite responsive to controls. It has been flown in standard configuration with rudder, elevator, throttle and ailerons, and has also utilized a coupled aileron and rudder system using a "jumper" servo cable that operates two servos from one channel simultaneously. Most manufacturers will make one of these jumper harnesses for you.

One of the biggest drawbacks to a biplane in the past has been the "birdcage" and this is one of the problems the original Hobo overcame with the use of one piece sawn plywood cabanes. This feature has been retained on the Wayfarer and reduces the problem to one of simply cutting out the two plywood cabane struts on a Dremel Moto Shop. To be sure, the extra wing will take a little more time than the conventional monoplane, but not much, since both wings are virtually identical with the exception of the ailerons in the lower wing.

Three quarters view shows ailerons in lower wing. May be coupled with rudder for sport flying.

CONSTRUCTION

Wings: The easiest way to construct the two wings is by using a wing jig. Both wings for the Wayfarer are built in the "Eggcrate" construction method. The top wing is built flat with no dihedral while the bottom wing has 3/4" dihedral under each tip. Both wings are identical in span and chord. If you use 48" stock for the upper wing, it can be built in one piece and no dihedral braces will be necessary. Since, however, 48" balsa sheet and strip stock is quite expensive, the plans show the use of standard 36" length of material. Begin construction of the wings by using a metal T-square and cutting out the hard 3/16" sheet balsa spars. Be sure that the notches for the wing ribs are cut exactly 3/32" wide and 1¼" deep on the front spar and 5/16" deep on the rear spars. Join the spars together by epoxying the 1/16" plywood dihedral braces in place over the spar center sections. Hobbypoxy Formula 4 quick drying epoxy was used throughout construction of the Wayfarer wherever epoxy is specified. While you're cutting out the plywood dihedral braces, cut out the leading edge and trailing edge dihedral braces for both the upper and lower wings.

All ribs are cut from 3/32" balsa sheet with the exception of the ¼" rib (UW-1) used in the center of the upper wing. It is suggested that you make plywood templates so that all ribs may be cut accurately and sanded smooth between the two plywood end templates. The 3/16" x 1/2" balsa leading edges are cut to proper lengths as are the 1/16" balsa leading and trailing edge sheeting.

Slip the ribs on to the front and rear eggcrate spars and make sure the spars are flush with the top and bottom of the ribs. When these are lined up properly over the plans, use a toothpick and add a fillet of Hobbypoxy 4 at all rib-spar junctions. Add the 3/16" x 1/2" balsa leading edge and the 1/8" x 1/2" tapered trailing edge stock. Make sure that the latter is lined up properly and retains the proper airfoil as shown on the plans. Hold the trailing edge and leading edge stock in place with masking tape until the Hobbypoxy 4 or Titebond glue dries. Following this, add the leading edge and trailing edge sheeting on the top wing panels followed by the top and bottom cap stripping. Make sure to taper the trailing edge of the top

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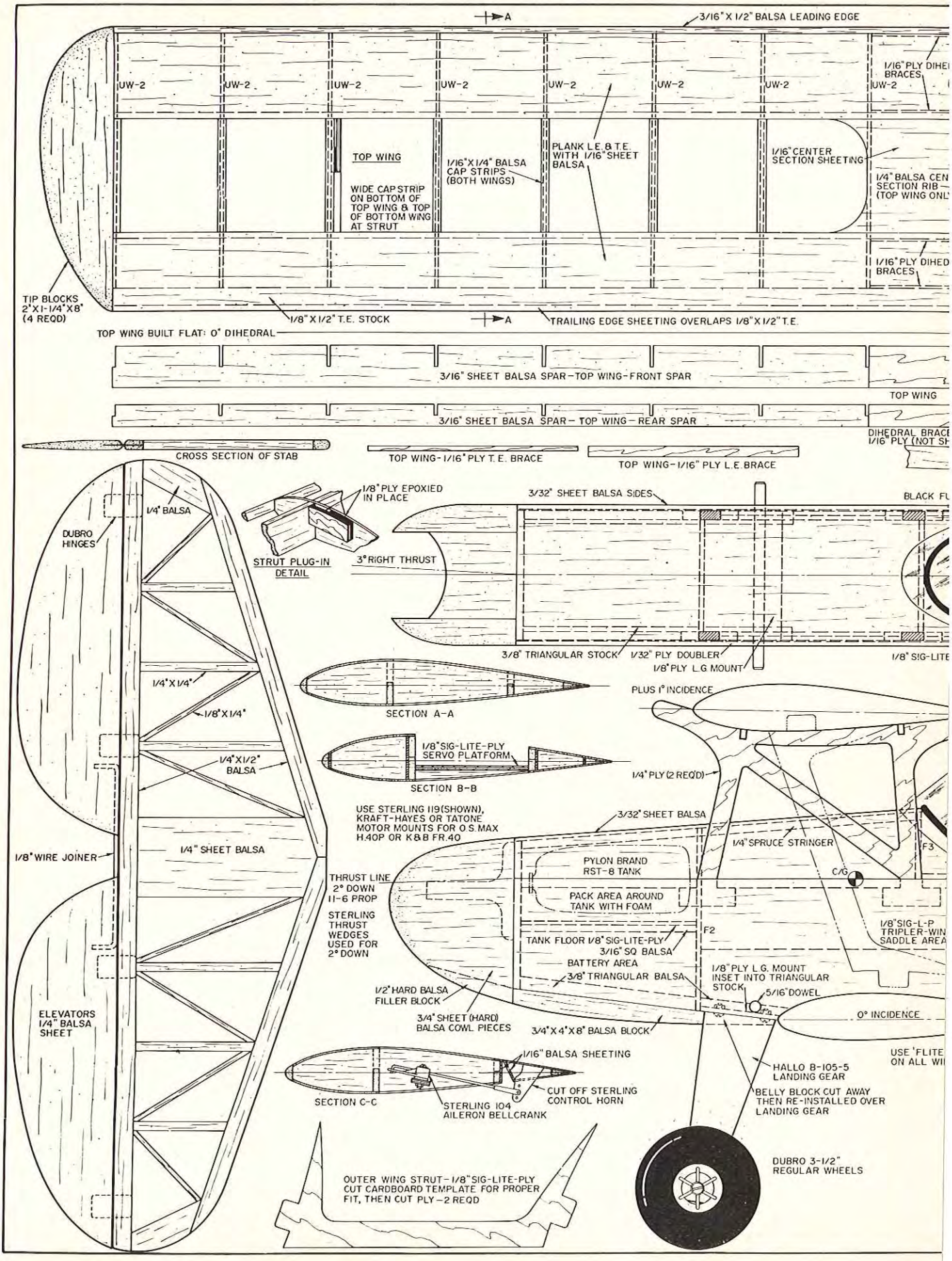
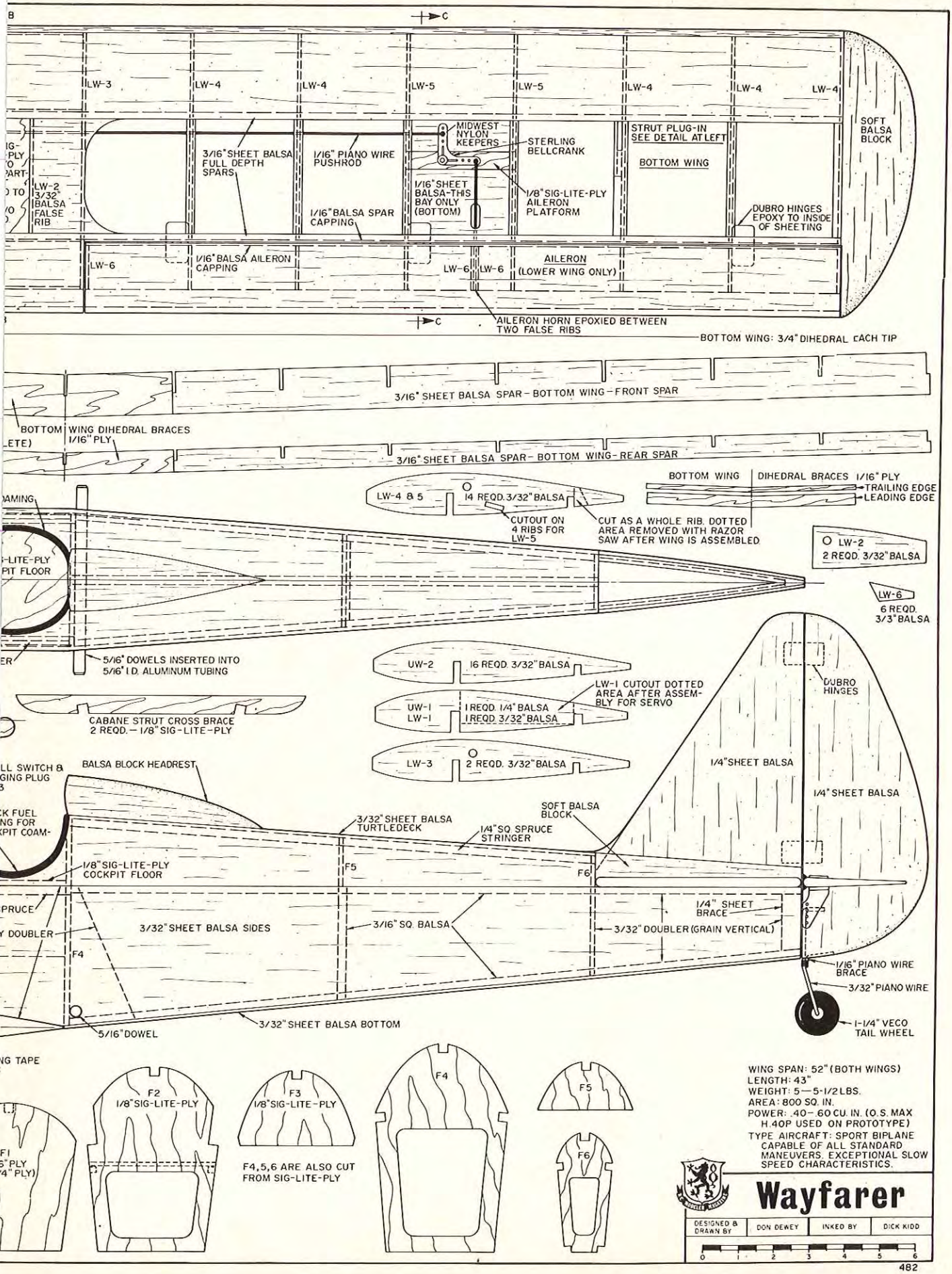
Front view shows straight top wing, dihedral in lower wing only.


A
3/16" X 1/2" BALSA LEADING EDGE
UW-2
1/16" PLY DIHE BRACES
TOP WING
WIDE CAP STRIP ON BOTTOM OF TOP WING & TOP OF BOTTOM WING AT STRUT
1/16" X 1/4" BALSA CAP STRIPS (BOTH WINGS)
PLANK L.E. & T.E. WITH 1/16" SHEET BALSA
1/16" CENTER SECTION SHEETING
1/4" BALSA CEN SECTION RIB (TOP WING ONL
1/16" PLY DIHED BRACES
TIP BLOCKS 2" X 1-1/4" X 8" (4 REQD)
1/8" X 1/2" T.E. STOCK
TRAILING EDGE SHEETING OVERLAPS 1/8" X 1/2" T.E.
TOP WING BUILT FLAT: 0° DIHEDRAL
3/16" SHEET BALSA SPAR - TOP WING - FRONT SPAR
TOP WING
3/16" SHEET BALSA SPAR - TOP WING - REAR SPAR
DIHEDRAL BRACE 1/16" PLY (NOT SH
CROSS SECTION OF STAB
TOP WING - 1/16" PLY T.E. BRACE
TOP WING - 1/16" PLY L.E. BRACE
1/8" PLY EPOXIED IN PLACE
3/32" SHEET BALSA SIDES
BLACK FU
1/4" BALSA
DUBRO HINGES
STRUT PLUG-IN DETAIL
3° RIGHT THRUST
3/8" TRIANGULAR STOCK
1/32" PLY DOUBLER
1/8" PLY L.G. MOUNT
1/8" SIG-LITE
1/4" X 1/4"
1/8" X 1/4"
SECTION A-A
PLUS 1° INCIDENCE
1/8" SIG-LITE-PLY SERVO PLATFORM
SECTION B-B
1/4" PLY (2 REQ'D)
1/4" X 1/2" BALSA
USE STERLING 119 (SHOWN), KRAFT-HAYES OR TATONE MOTOR MOUNTS FOR O.S. MAX H.40P OR K&B FR.40
3/32" SHEET BALSA
1/4" SPRUCE STRINGER
F3
1/8" WIRE JOINER
1/4" SHEET BALSA
PYLON BRAND RST-8 TANK
C/G
THRUST LINE 2° DOWN 11-6 PROP
PACK AREA AROUND TANK WITH FOAM
STERLING THRUST WEDGES USED FOR 2° DOWN
F2
1/8" SIG-L-P TRIPLER-WIN SADDLE AREA
TANK FLOOR 1/8" SIG-LITE-PLY
3/16" SQ BALSA
BATTERY AREA
3/8" TRIANGULAR BALSA
1/8" PLY L.G. MOUNT INSET INTO TRIANGULAR STOCK
5/16" DOWEL
1/2" HARD BALSA FILLER BLOCK
3/4" SHEET (HARD) BALSA COWL PIECES
3/4" X 4" X 8" BALSA BLOCK
0° INCIDENCE
USE 'FLITE ON ALL WI
ELEVATORS 1/4" BALSA SHEET
1/16" BALSA SHEETING
HALLO B-105-5 LANDING GEAR
CUT OFF STERLING CONTROL HORN
SECTION C-C
STERLING 104 AILERON BELLCRANK
BELLY BLOCK CUT AWAY THEN RE-INSTALLED OVER LANDING GEAR
DUBRO 3-1/2" REGULAR WHEELS
OUTER WING STRUT - 1/8" SIG-LITE-PLY CUT CARDBOARD TEMPLATE FOR PROPER FIT, THEN CUT PLY - 2 REQD



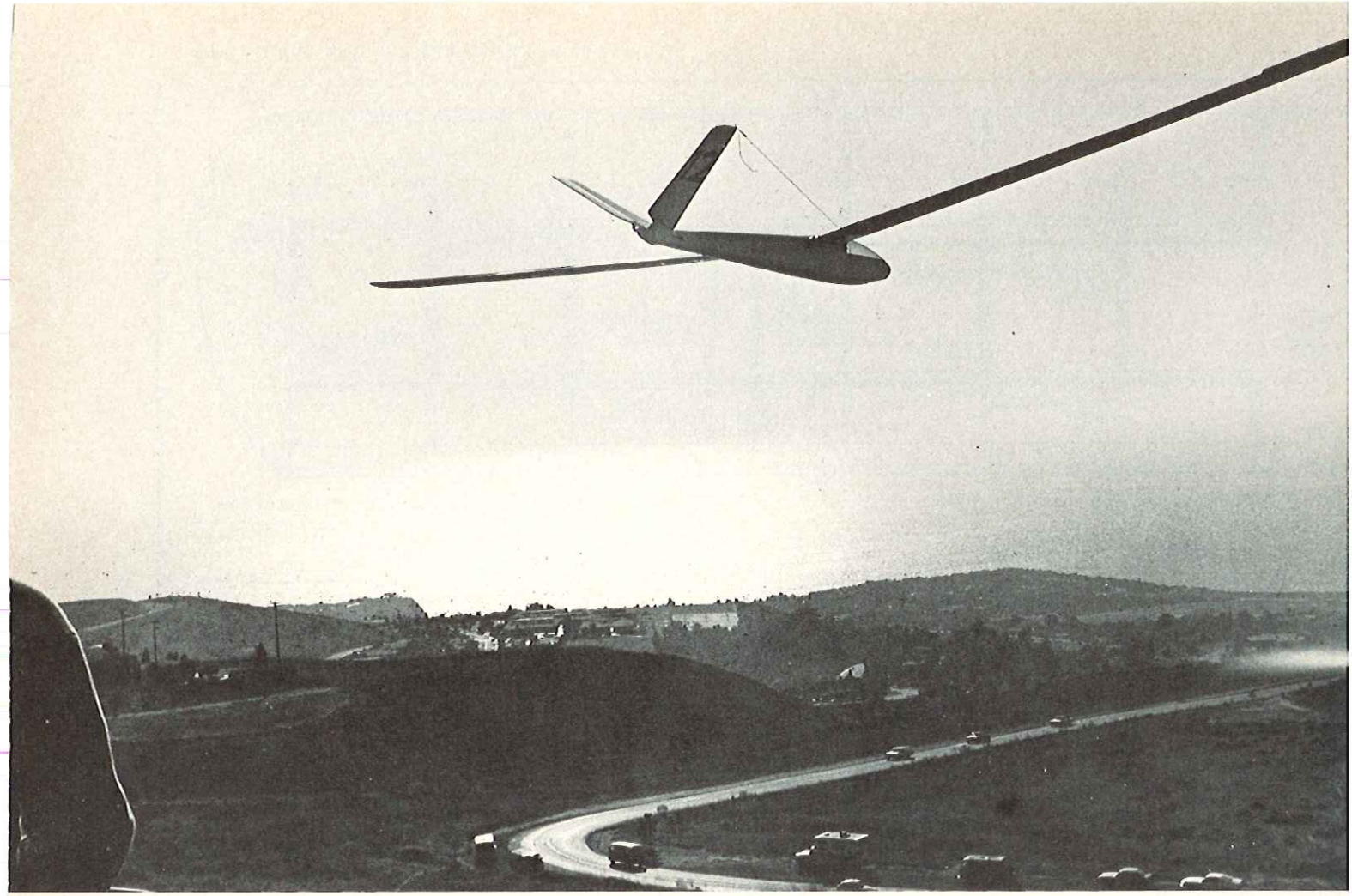
WING SPAN: 52" (BOTH WINGS)
LENGTH: 43"
WEIGHT: 5—5-1/2 LBS.
AREA: 800 SQ. IN.
POWER: .40—.60 CU. IN. (O.S. MAX H.40P USED ON PROTOTYPE)
TYPE AIRCRAFT: SPORT BIPLANE CAPABLE OF ALL STANDARD MANEUVERS. EXCEPTIONAL SLOW SPEED CHARACTERISTICS.

Wayfarer

DESIGNED & DRAWN BY	DON DEWEY	INKED BY	DICK KIDD

0 1 2 3 4 5 6

482



SPECIALIST 'V'

HIGH PERFORMANCE SAILPLANE DESIGNED FOR SPORT OR COMPETITION

BY KEVIN FLYNN

The first prototype of the Specialist V was built early in 1971 simply because I wanted something that looked different from the usual sailplane. The model also had to resemble a full-sized glider, one of my favorites being the HP-14. So, after numerous drawings and a few cold ones, or maybe the other way around, I arrived at the final design for the Specialist V.

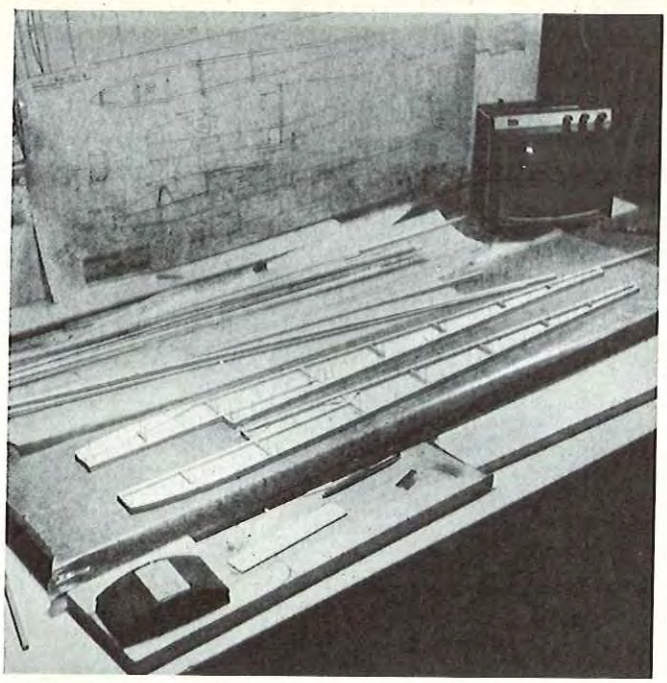
The prototypes have all flown quite well in light wind conditions, but really come to life in a strong breeze. Here are a few of its particular "do's and don'ts":

1) The glide is excellent.
2) It penetrates extremely well.
3) It can make about a 70 degree bank in a thermal without dropping its nose.
4) It can fly inverted!
5) It will almost roll . . .
6) It is extremely sensitive to elevator control so keep the movement to a minimum.
7) The rudders work normally and need maximum movement.

When I completed construction of the first prototype I found that the Specialist V was quite different for me. On the first flight I was banging the stick to every corner on the Kraft transmitter thinking that the model was unstable. What, in fact, had happened was that I had been flying my docile Blue Max sailplane for almost a year previously which was radically different compared to this high performance model. But, when I finally settled down and overcame my first flight "heart failure," I learned to fly it properly. My error with the Specialist V was one that all beginners experience immediately – overcontrolling! I found that moving the stick about 1/4" – 3/8" in any direction was quite adequate for normal flight maneuvers. Now, without any further ado, a few tips on building the Specialist V.

CONSTRUCTION: GENERAL

The canopy on my original model came from a Cirrus kit, but any large commercial canopy will fit. Be sure to use Titebond glue for all joints during construction and very soft balsa blocks for the rear turtle decking. In fact, if you want to decrease the weight even more, formers and sheeting can be



Fuselage sides laid out with 3/16" square balsa.

'V' – Tail blocked up while fuselage is drying.

substituted for the solid balsa turtle deck. Be sure to try to obtain medium light wood during construction . . . I used Sig balsa throughout and finished the model with Super MonoKote. Black plastic Contact brand shelf paper cutouts were used for trim. This is inexpensive and costs only 49 cents a yard at the dime store. Use Super MonoKote hinges at least 1¼" wide since any narrower hinges than this will tear after prolonged usage.

WING:

The only difficult part in construction is the wing so we might as well begin building at this point. The original wing is in one piece but can be built in two if desired. Cover the plan with wax paper and let's get started. First, pin down the leading and trailing edge strips on the plan. Notch the trailing edge where indicated for the ribs. Pin down the bottom hardwood spar (4' long if available) rear 3/16" spar, then start adding the ribs. When dry, add the top spar. Build the other panel while this one is setting up. You might as well also cut out the tail surfaces and sand to the section shown on the plan.

Now comes the boring part, which is cutting out all of those 1/16" sheet balsa shear webs. The grain runs vertically and they must be glued to both sides of the main spars. **Do not** leave these out or you will have a two piece wing after the first flight! When this structure has dried, sand the wing panel smooth and glue together to give 6" dihedral under each tip. Cut out the dihedral braces from 1/8" plywood and glue them in place, leaving the whole assembly to dry overnight.

The next day, add the 1/16" lead-

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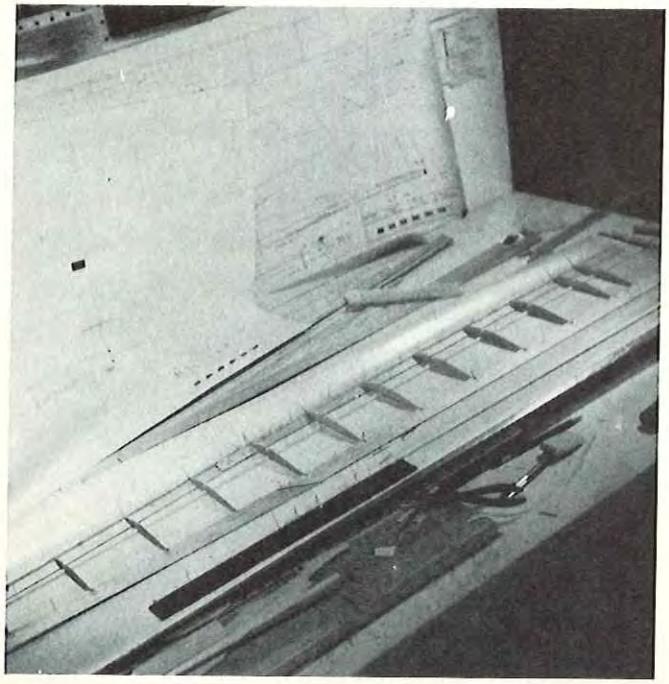
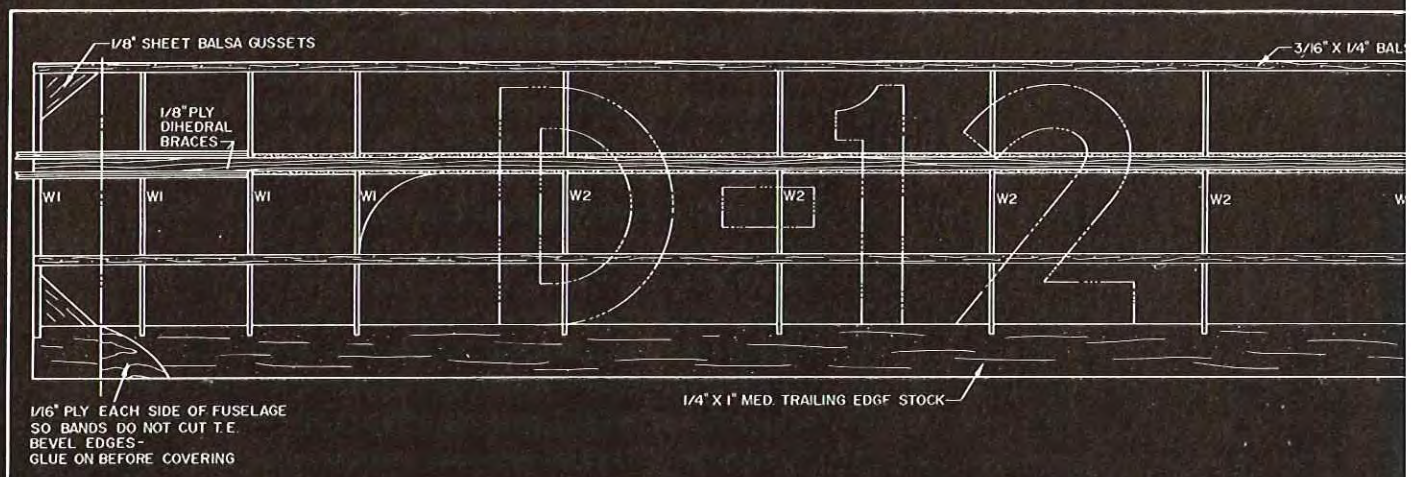
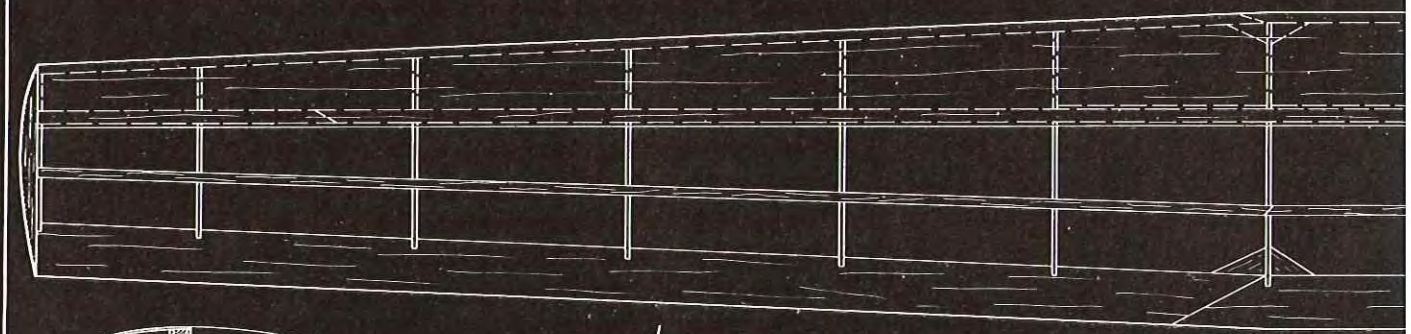
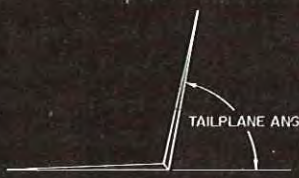
Straightforward wing construction.

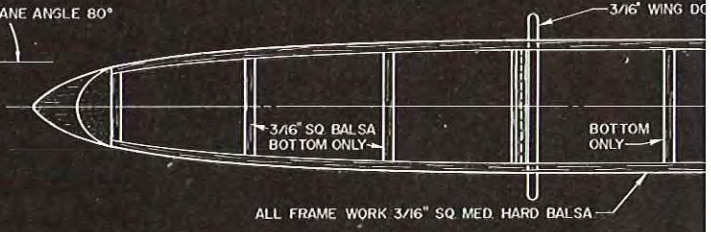


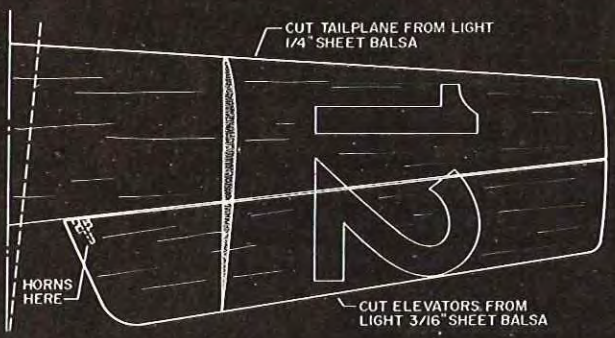
Completed fuselage with canopy in place.

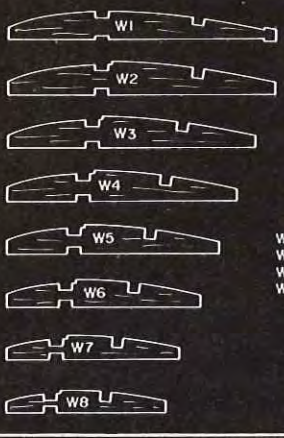






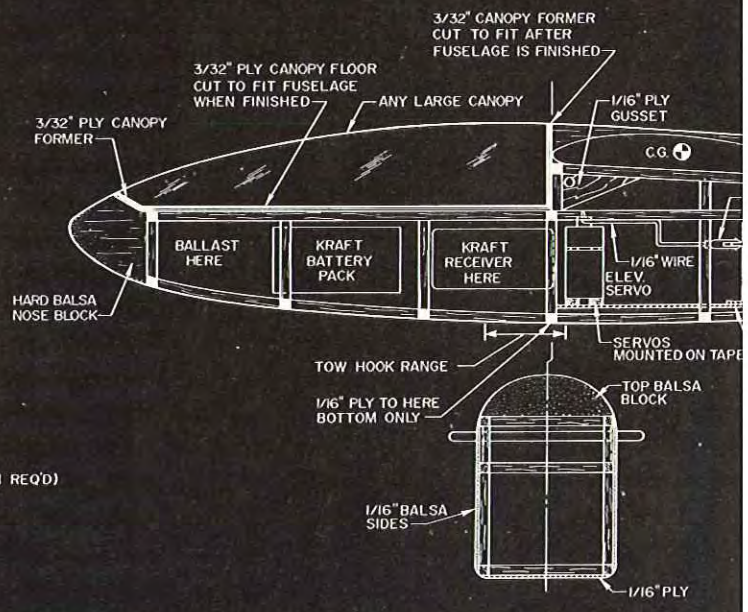




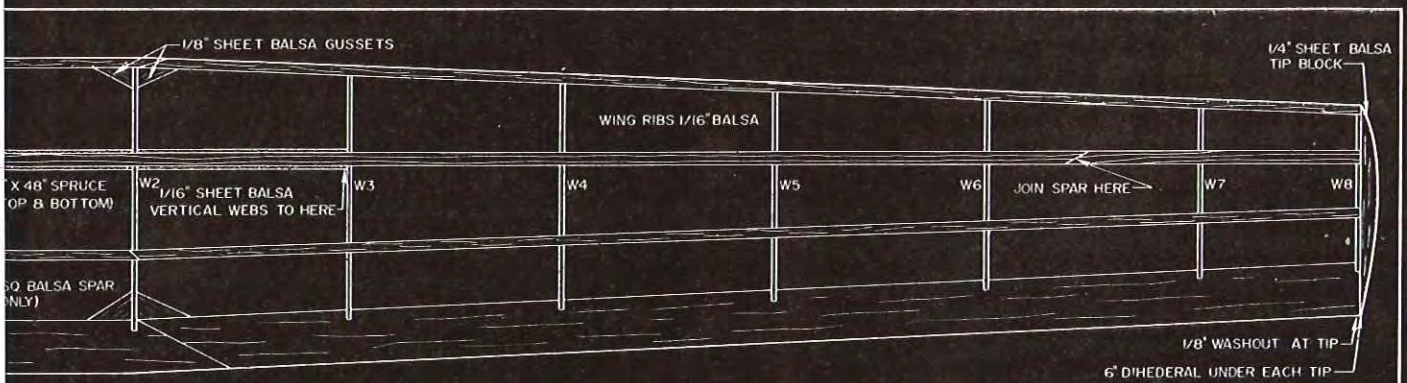


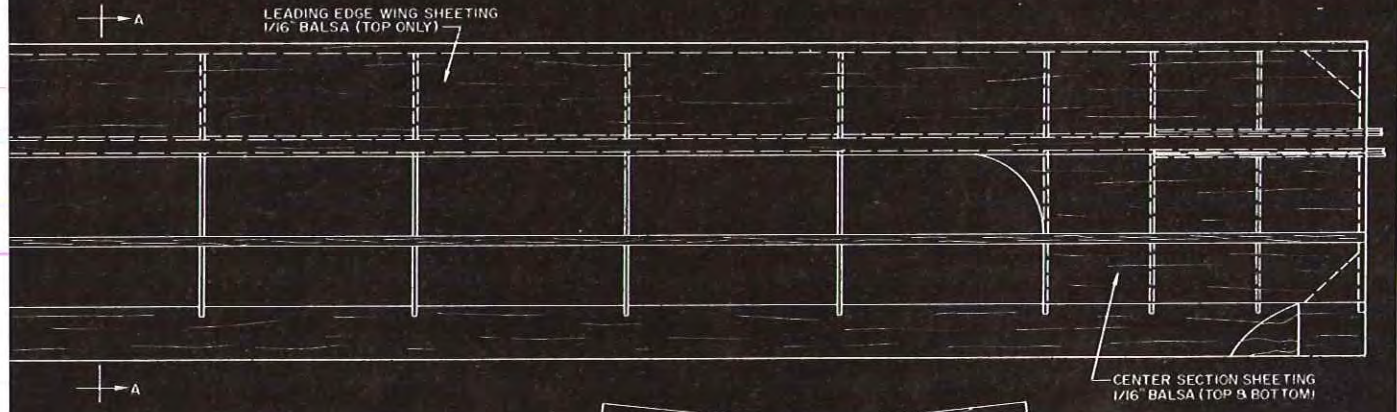
RIB REQUIREMENT

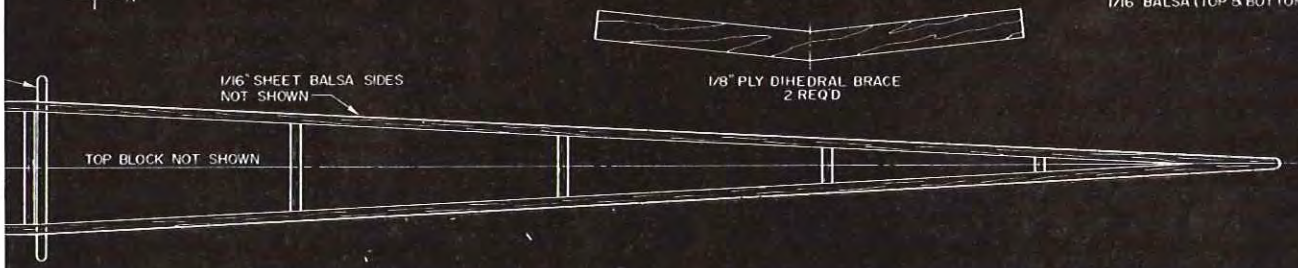
W1 - 1/8" BALSA (2 REQ'D)
W1 - 1/16" BALSA (6 REQ'D)
W2 - 1/16" BALSA (12 REQ'D)
W3 - W8 - 1/16" BALSA (2 EACH REQ'D)

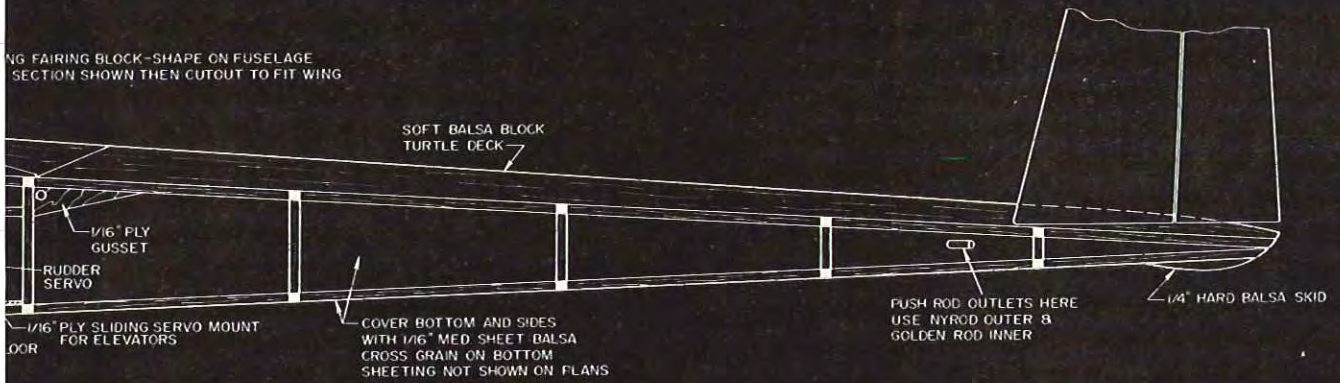


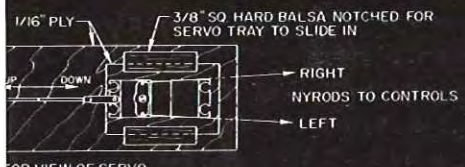
PLANS AVAILABLE – SEE PAGE 104











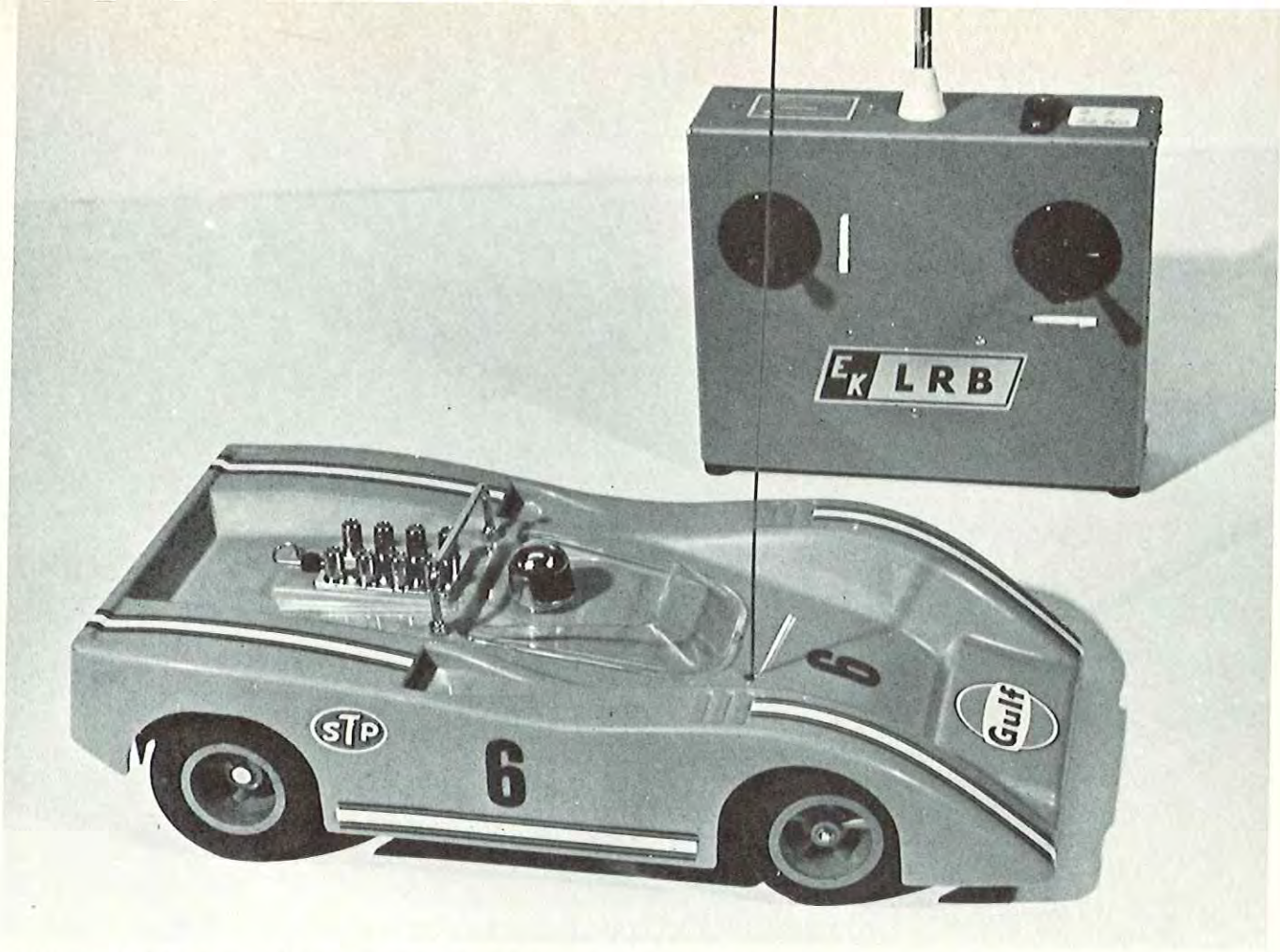
WING SPAN – 106"
WING AREA – 590 SQ IN.
LENGTH – 38-3/8"
WEIGHT – 2-1/4 LBS

SPECIALIST 'V'

DESIGNED BY DRAWN BY	KEVIN FLYNN	INKED BY	DICK KIDD

0 1 2 3 4 5 6

481



The Jerobee MK-8B 'Comando' on Porsche Coupe, less radio, is just what the doctor ordered for those flyers who already have radio gear. And if you don't, the EK LRB two channel proportional system is an ideal choice for reliability and performance.

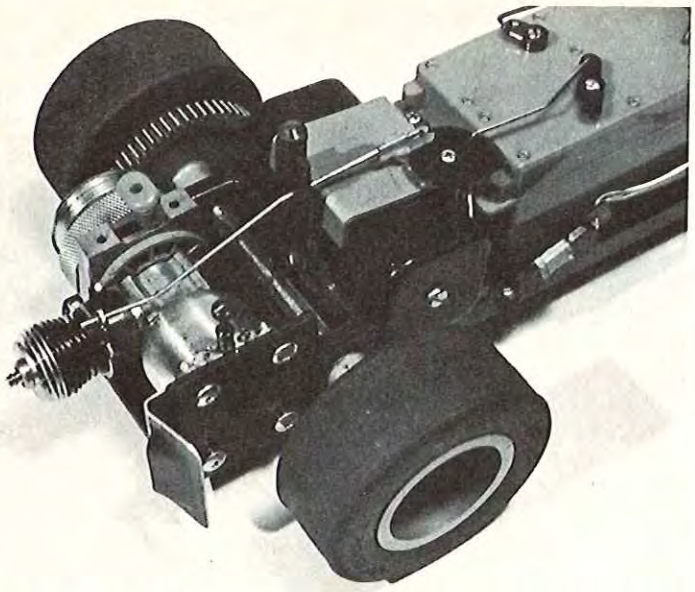
RCM tests the

JEROBEE COMANDO-EK LRB

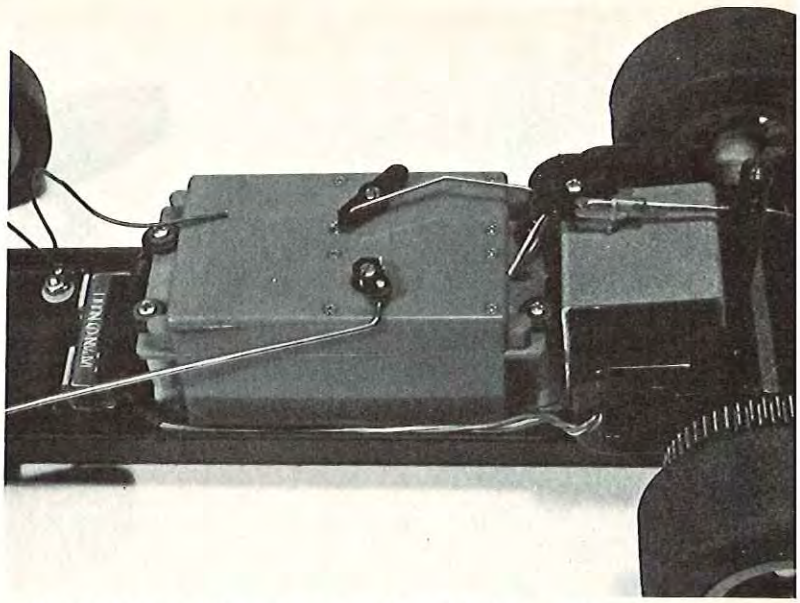
Approximately two years ago 1/8th scale radio controlled auto racing made its presence known on the R/C scene. During the two years that followed many cars made their appearance and a surge of interest rose to a peak and suddenly declined. In our opinion, one of the greatest contributing factors to this decline of interest was the number of vehicles made available to the consumer which were not only extremely costly, but failed to hold together and perform in the manner which the consumer expected. Again, in our opinion, the fault lay in the manufacturers attempt to design a miniature radio controlled racing vehicle which duplicated the full-sized cars. Experience soon showed that it took more than the average "man on the street" to hold these cars together for any length of time or to race them in a satisfactory manner.

Now, rising out of the ashes like the legendary Phoenix is the Jerobee Comando radio controlled gas powered racing car which is completely assembled and is available with engine and radio control system and complete instruction manual, or without R/C system, ready for the custom installation of your own radio. This is a 1/12th scale chassis and body rather than the more conventional and larger 1/8th scale racing car. The Comando has a 4' turning radius and a scale speed of up to 240 mph. Interchangeable body styles are available and the entire vehicle has been safety engineered with a lightweight chassis, fail-safe throttle and steering system with fully proportional throttle and steering control. It is obvious that this vehicle has been tested to aerospace standards for, in fact, it has been manufactured by an aerospace firm – Jerobee Industries, Inc., being a subsidiary of Rocket Research Corporation, York Center, Redmond, Washington 98052.

The unit we tested was obtained as a car and engine "shell" in which we installed the EK Logictrol 2 channel LRB proportional system as indicated in the accompanying photographs. The features of the Comando include a high-impact strength injection molded frame with independent front suspension and Ackerman steering. A heavy duty rear axle is provided as is a recoil pull starter on the Cox .049 engine which is complete with a centrifugal clutch. Realistic "Mag" type wheels add to the realism of the Comando. A steel drive gear and high strength molded main gear compliment the precision molded high strength Cycolac® body, the latter tilting forward for easy removal. A complete set of racing stripes are included with the



View of Cox .049 and throttle linkage from E.K. LRB. 'Note functional air scoop behind tire.



E.K. "Brick" installation. Four pencell pack behind receiver-servo unit.

kit and racing numbers and decals can be added as desired, as, once again, indicated in the photographs.

The specifications of the Jerobee Comando include a 1/12th scale chassis and body with a scale speed of 240 mph; a turning radius of 4'; a Cox .049 engine; a wheel base of 7½"; a track of 4¾"; front tires 2" x 5/8"; rear tires 2¼" x 7/8"; a track weight of 30 oz.; and a gear ratio of 5.6:1.

The EK LRB chosen for this installation was the two stick version with the throttle on the left and the steering on the right and operating on the newly assigned frequency of 72.960 MHz. The "brick" receiver-servo unit was placed in the approximate center of the chassis with the switch mounted directly in front of it. Behind the brick unit was mounted the four pencell battery box which contained four alkaline energizers. A study of the photographs will indicate the linkage used for throttle and steering.

Since we at RCM have used the EK Logictrol LRB single stick version for many months in sailplanes and powered aircraft, there was no question as to the performance and reliability of this outstanding proportional system, modestly priced in the $100.00 price bracket. With respect to the EK-Comando unit, we found that the engine started easily after the first few tanks of gas and that the car performed in such a manner as to be truly amazing. The actual speed of the car ranges between 23 and 28 mph, with very little tendency to spin out in the turns even when full-lock steering and full throttle was applied. As an additional test, we put this car up against three of the .19 powered 1/8th scale R/C auto racers and were beaten by only one of them, the Associated car . . . a rather remarkable feat for a small .049 powered vehicle! As an added "torture-test" we ran the vehicle head on into a concrete wall several times in succession and were unable to crack the high impact Cycolac® body. Range with the EK LRB system was far more than would ever be necessary in operating this car.

From an appearance standpoint we would have to rate the Jerobee Comando as outstanding. We could say no less about its performance or about

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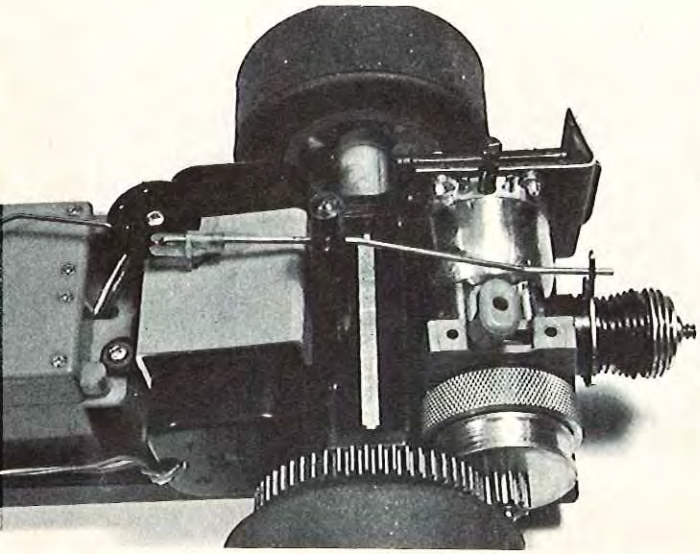
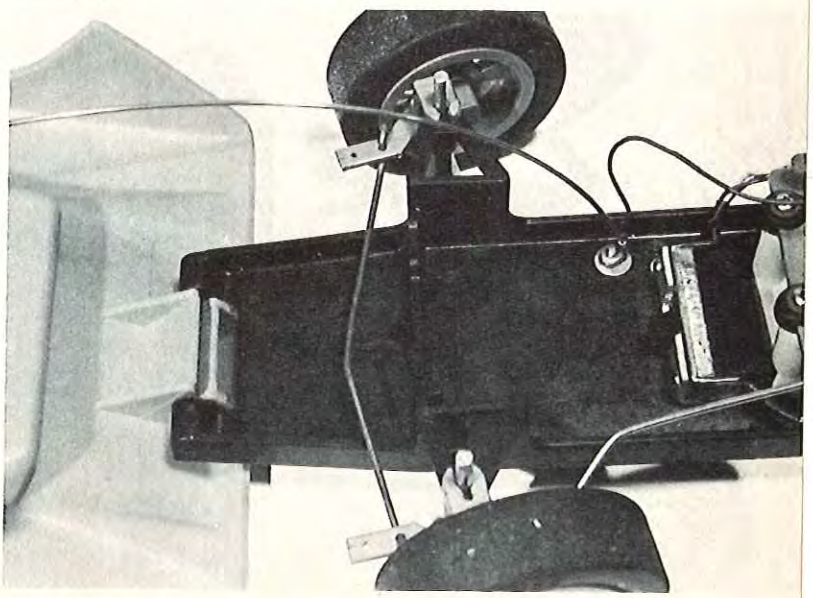
Close-up of pull starter, throttle, flywheel and centrifugal clutch.



Cycolac® body hinges at front of chassis. Note rugged steering arms and tie bar.



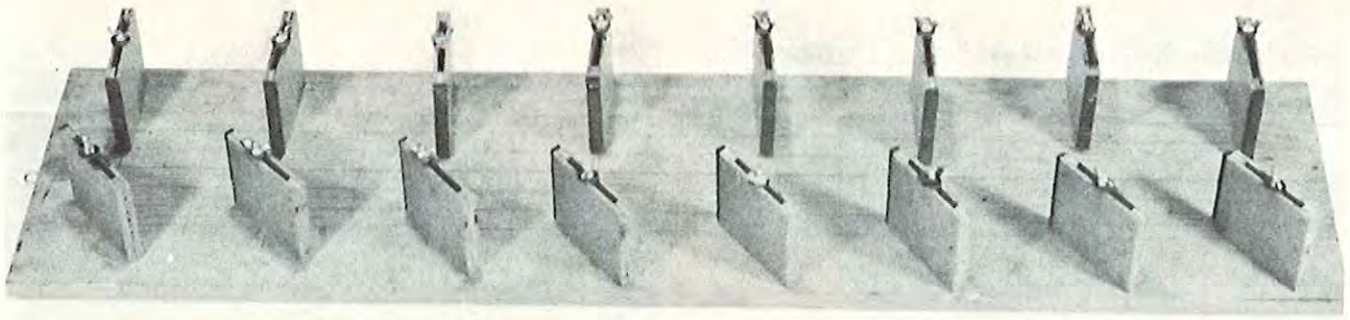


Figure 1: Versatile fuselage jig is adaptable to almost any fuselage.

RCM Fuselage Jig

BY W.A. THIENES

The majority of RC'ers who build their airplanes try to divise building and finishing methods that will enable them to complete an airplane in a shorter time. Using conventional balsa and plywood fuselage construction methods, and assembling the fuselage sides and formers "in the air" using rubber bands, pins, diagonal braces and appropriate language, it is difficult, if not impossible, to obtain a properly aligned fuselage. This fuselage building jig will provide the means to obtain a straight centerline, no twist, and have all formers at 90 degrees to the centerline of the fuselage.

Figure No. 1 is a photo of the completed jig. The cost is very nominal, as all there is to it is a piece of 3/4" x 12" x 48" warp-free pine or plywood, 16 five inch long 1/4" carriage bolts, washers and wing nuts, and some 1/8" hardboard and 1/4" plywood slotted jig blocks. The 12" x 48" base has a centerline the length of the board with three parallel guidelines on 1" spacing on either side of the centerline. Crosslines on 3" spacing are marked off at right angles to the centerline, this is a sufficient number of guidelines, although some builders may desire to add more guidelines, or actually glue a graph paper grid to the board. A carriage bolt is located every 6", starting on the first crossline from the end of the base board. The bolts are located 4" out from the centerline for the first five pair of bolts while the last three pair are located 3" out from the centerline. The bolts are inserted from the underside of the board in 1/4" holes drilled through the board. This spacing should allow sufficient opening and closing of the slotted jig blocks to construct a fuselage for any of the R/C airplanes in the air today. The carriage bolts serve as guide pins for the 3¾" x 4" slotted jig blocks. Figure No. 2 is a drawing of the base board showing the alignment grid and the carriage bolt guides.

The slotted jig blocks are made from 1/8" hardboard with a 1/2" wide spacer of 1/4" plywood glued and nailed at each end of the spacer. The plywood spacer permits a nice smooth fit of the jig block over the carriage bolt guide. The 3¾" depth allows sufficient threads of the carriage bolts

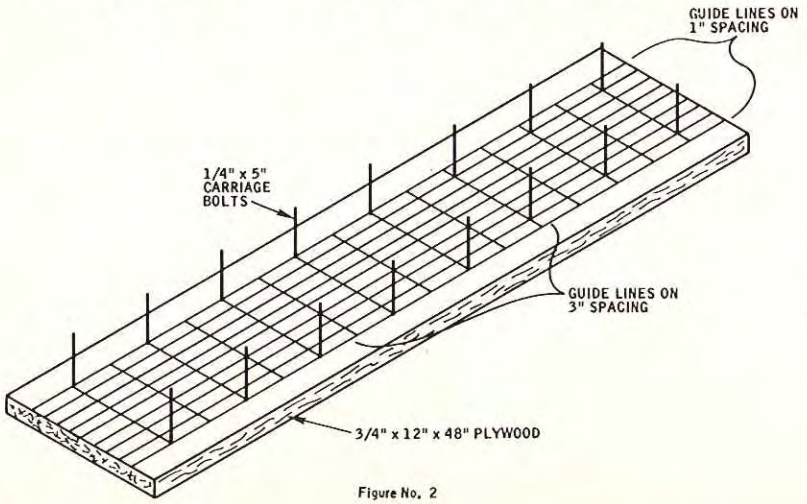


Figure No. 2

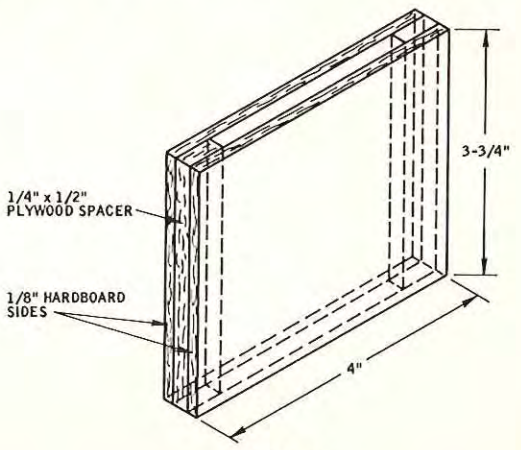


Figure No. 3

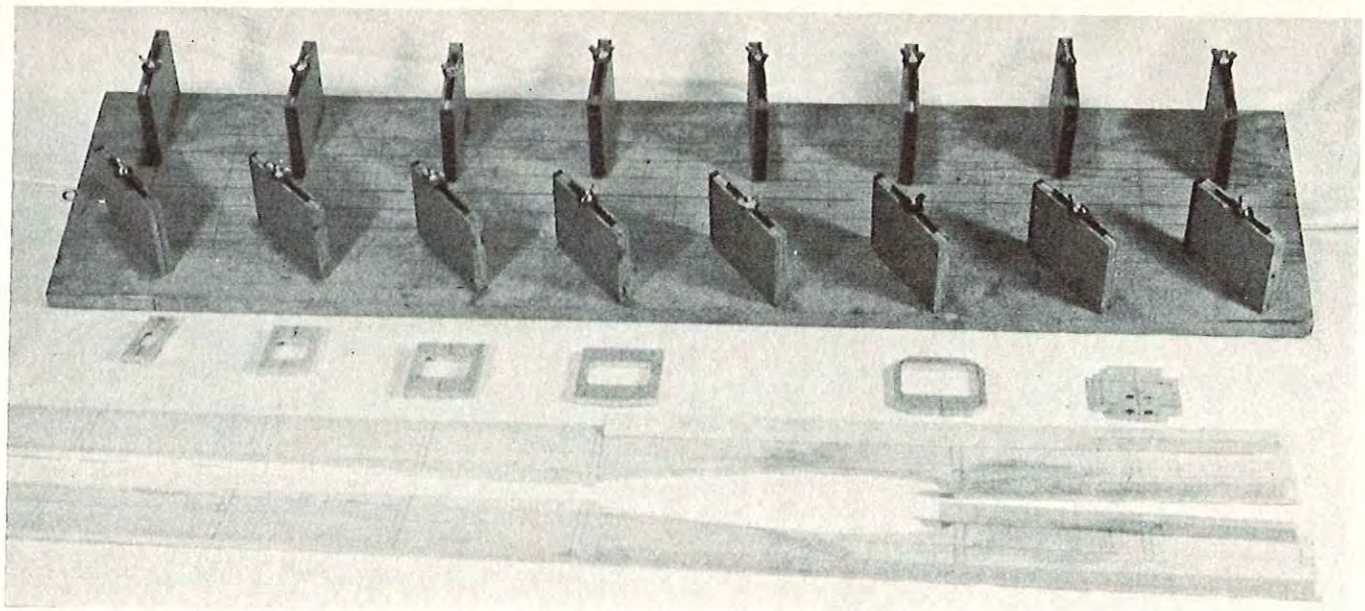


Figure 4: View of fuselage sides, formers, and RCM Building Jig.

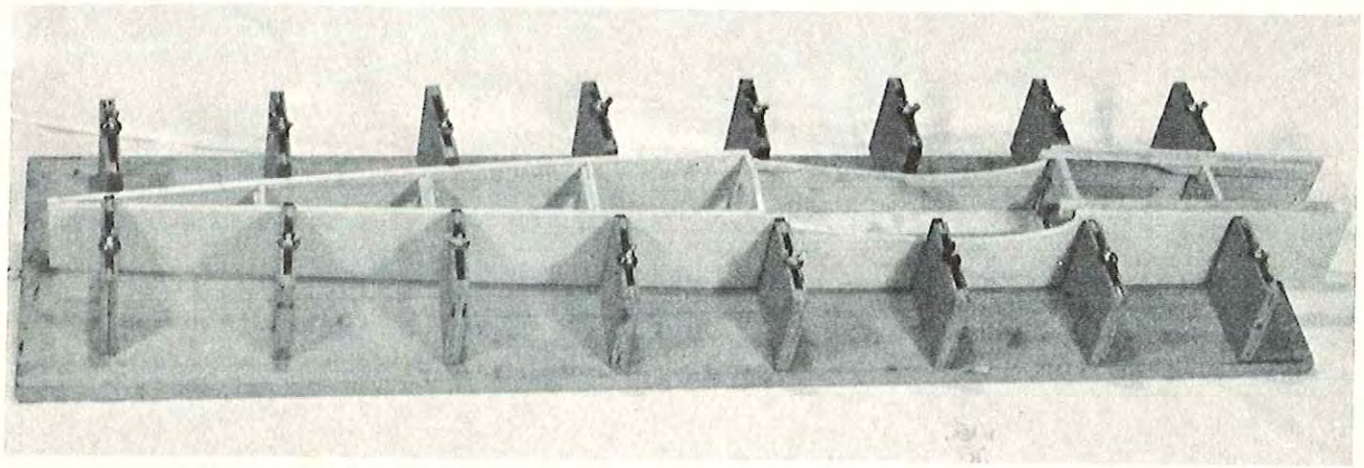


Figure 5: The fuselage placed in the jig and the blocks tightened.

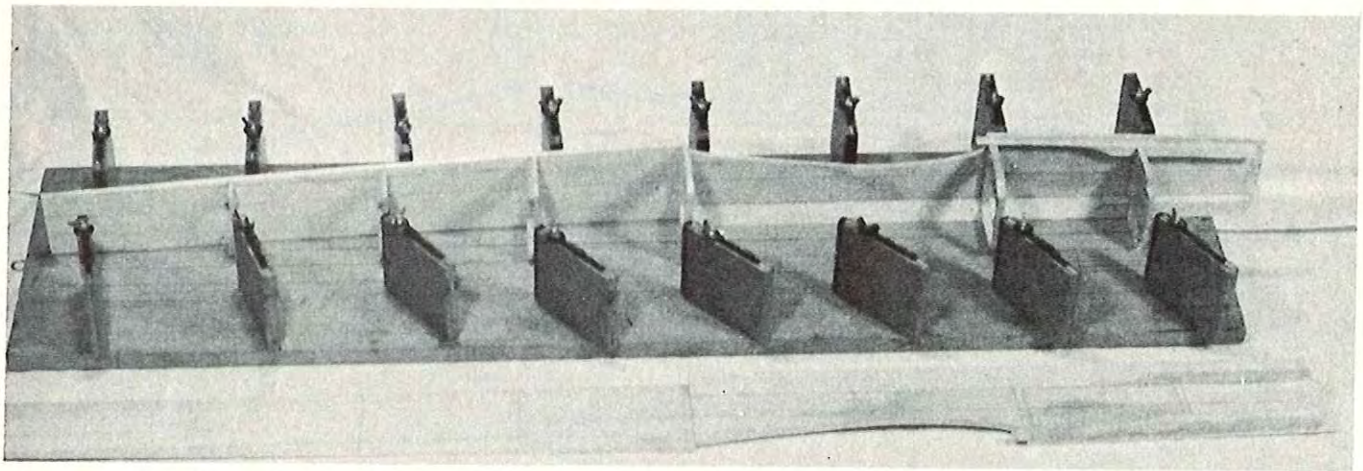


Figure 6: Jig blocks loosened on one side so that formers may be removed.

above the jig block for a washer and wingnut. Figure No. 3 shows a drawing of the slotted jig block. It is highly recommended that you find a friend with a good table saw or radial arm saw to cut the hardboard sides for the jig block to insure that they have 90 degree corners. After the jig blocks are assembled, automobile weather stripping can be glued to the end of the jig block that contacts the fuselage sides.

The jig is very easy to use in building a fuselage, especially the type that has a straight top or bottom. The fuselage sides are prepared in the usual manner with all doublers, motor mounts, and edge strips glued in place and former locations marked on the inside of the sides. The formers should have a vertical centerline marked on

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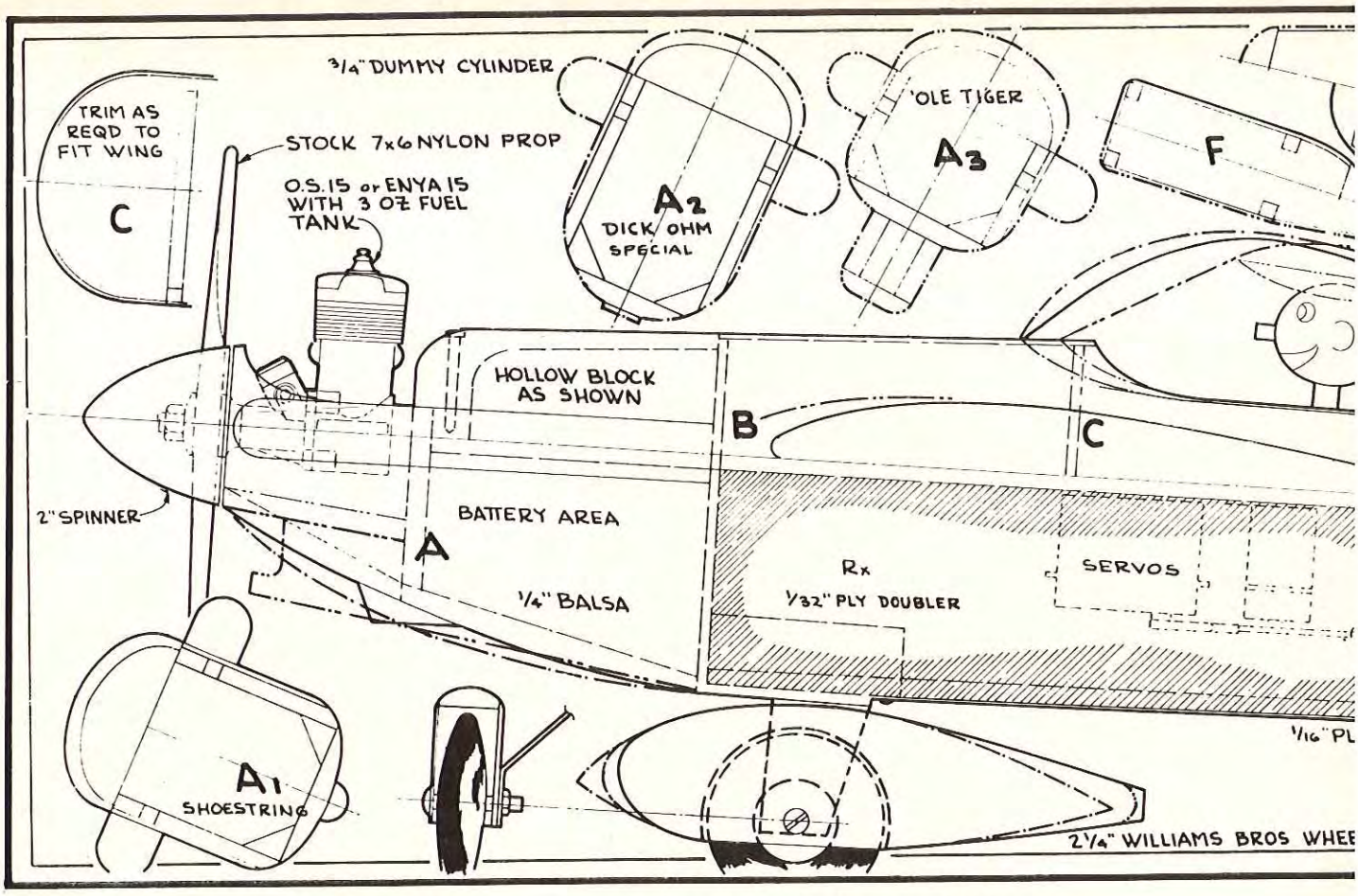
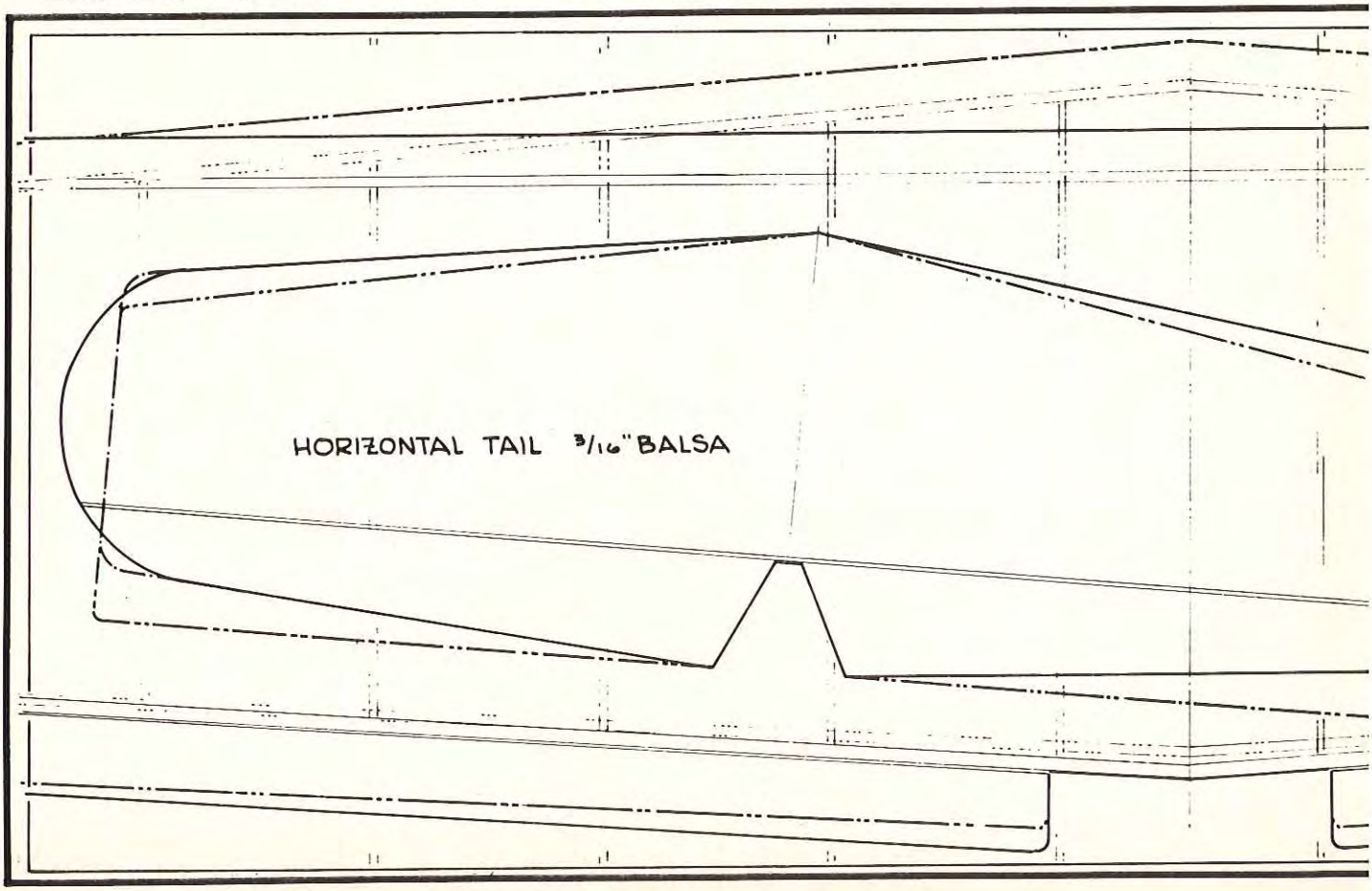
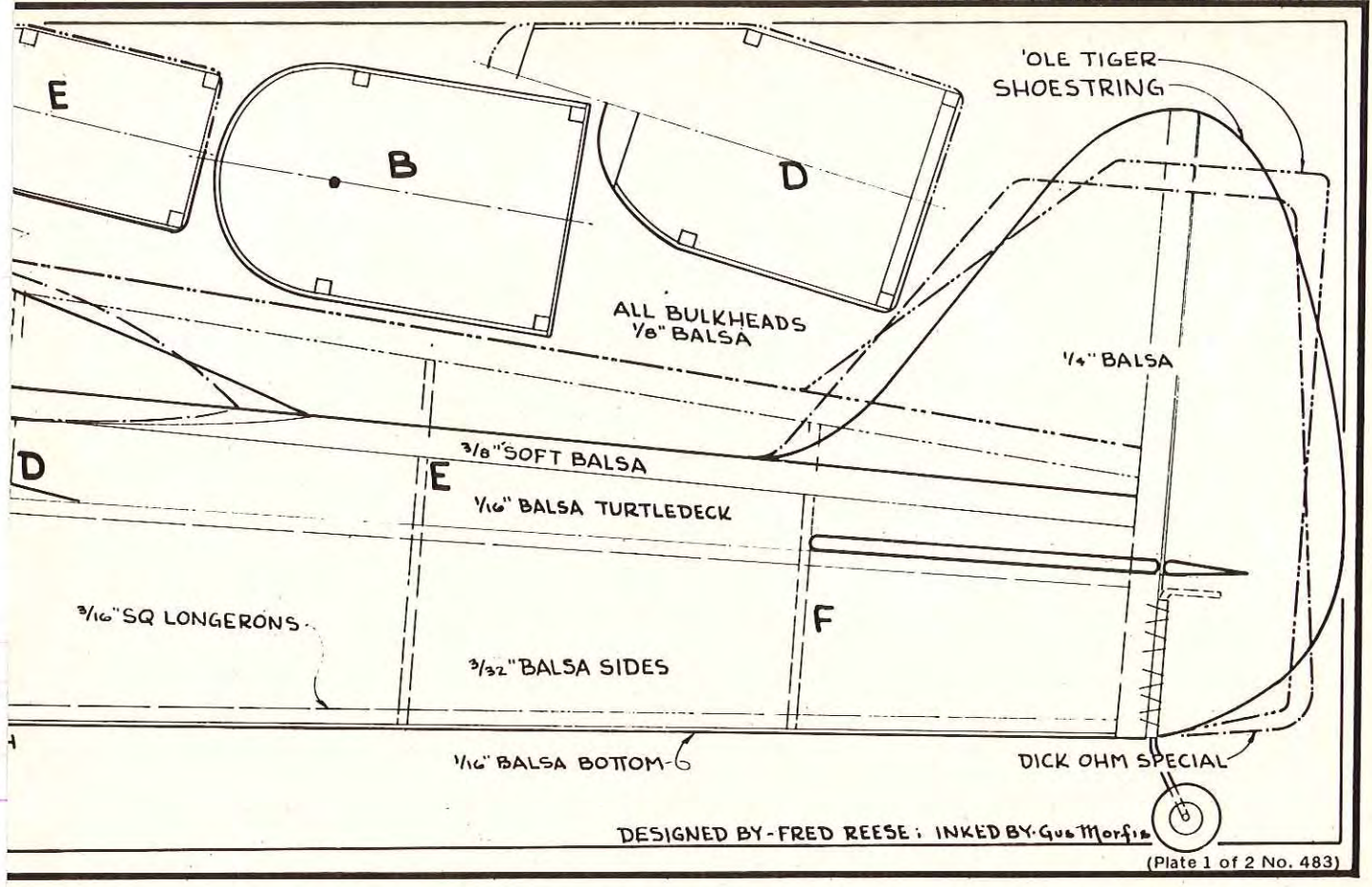


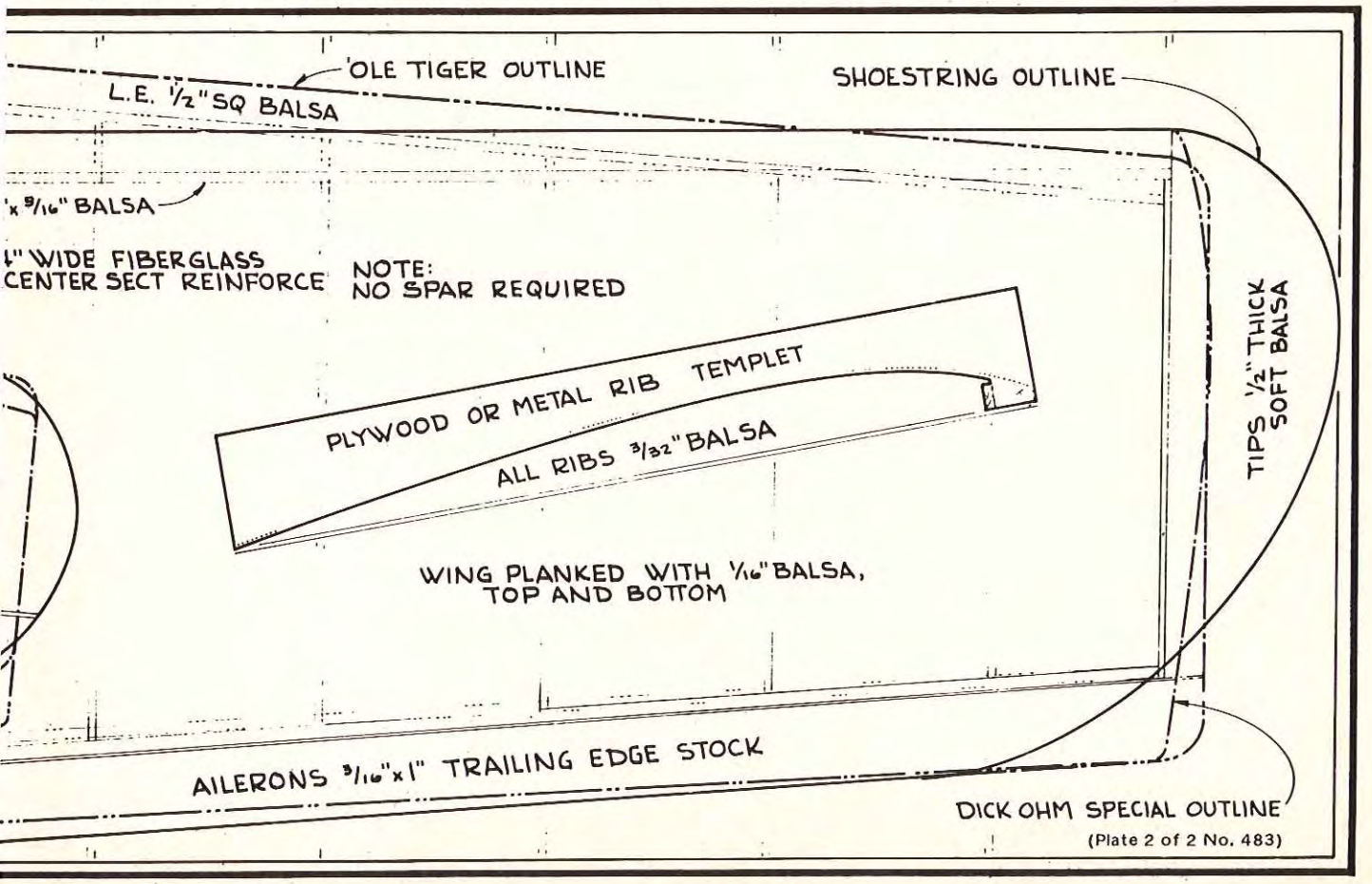
QUARTER MIDGETS



PLANS AVAILABLE – SEE PAGE 104



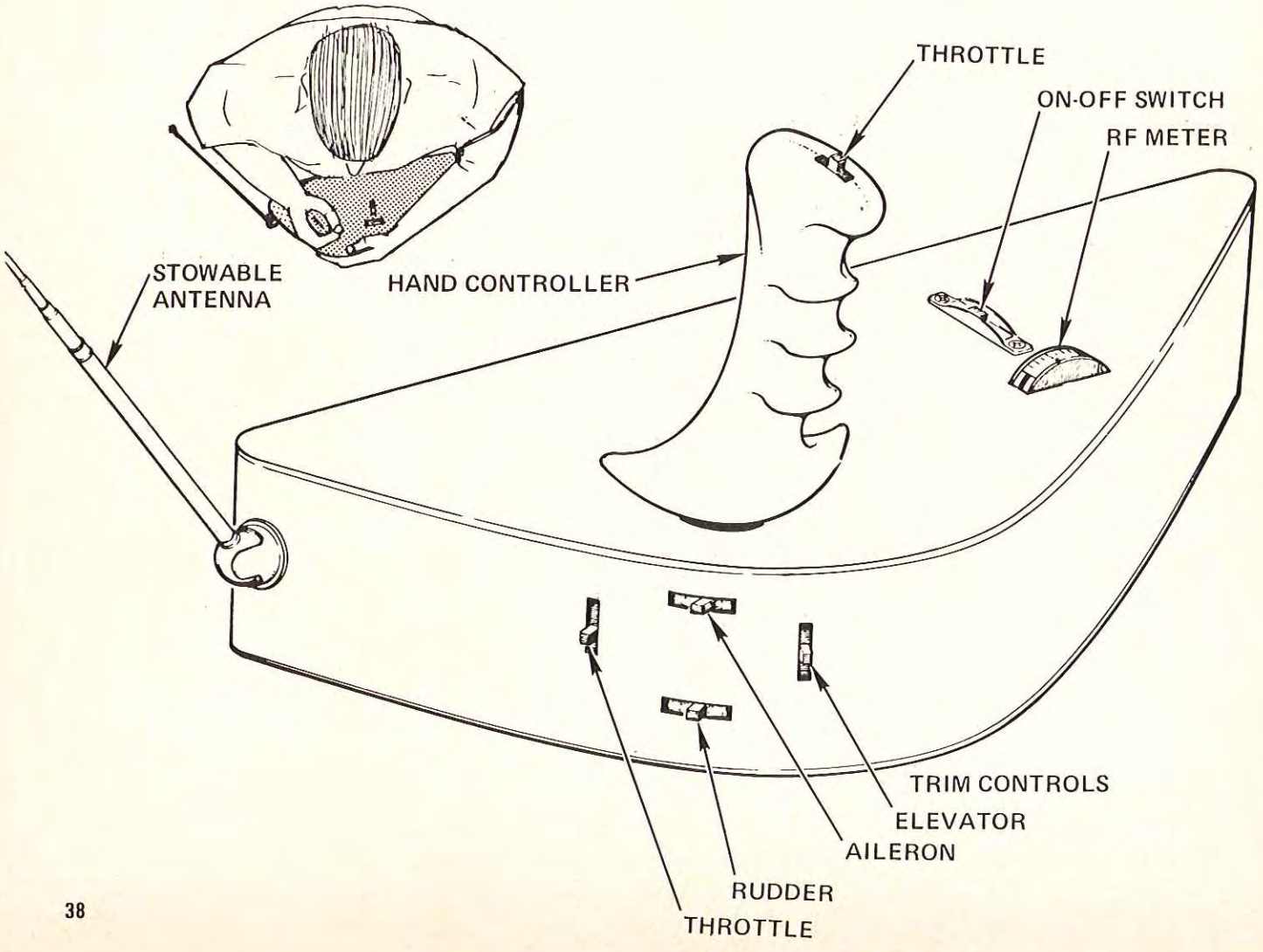
NO CONSTRUCTION ARTICLE IS NECESSARY FOR THESE THREE QUARTER MIDGETS. YOU CAN BUILD A SHOESTRING, OLE' TIGER, OR DICK OHM SPECIAL FROM THESE PLANS BY FRED REESE AND GUS MORFIS. (COURTESY OF NORTHROP MODEL AIRCRAFT CLUB)



Close-up of two of author's original hand-made transmitter prototypes. Text illustrates principles behind design.

Jodi Taylor, member of the musical group, 'The Rising Generation,' shows correct method of holding new single stick transmitter.

Figure 1 shows how the transmitter fits the natural shape between the arm and body when held properly. Note also how the axis of the stick is offset to match normal wrist flexion. The trim controls are positioned to be easily accessible and distinquished by the fingers of the left hand. The main throttle control is on top of the hand controller and easily manipulated by the thumb of the right hand.



SINGLE STICK DEVELOPMENTS

BY R.E. JONES

An Optimized Single Stick Transmitter With Apollo-type Handgrip . . . . . Tomorrow's Transmitter Configuration?

With the increasing interest in single stick transmitters, RC equipment manufacturer have been looking into alternate control layouts. One such configuration had a rather unique beginning. I had written an article on single vs. dual stick configurations and raised enough interest to be invited to speak at several RC clubs. The article was based upon my thesis project and had nicely "put down" single stick as the less desirable configuration. Knowing that all the single stick fans would be out for my scalp when I spoke to the Birds Club of Signal Hill, California, as well as other clubs, I decided to go armed with an attention-getting alternative. This took the form of an optimized single stick transmitter mockup. It utilized an Apollo-type hand controller with a thumb actuated throttle lever on top, a specially designed case, and an antenna whose placement allowed not only an optimized radiation pattern but complete stowage when not in use.

The idea worked like a charm and raised so much interest I decided to see if a manufacturer might be interested. After taking several snapshots of the mockup, a short letter was written and, with some trepidation, sent off to Phil Kraft. A week or so slipped by and then, low and behold, Cliff Weirick was on the phone inviting me down to Vista to talk.

After the grand tour of the new plant, Cliff and I discussed the hand controller vs. stick aspects of the design and decided to build up a working prototype of the mockup. Phil had joined the discussion by then and gave his blessing to the project.

Cliff was anxious to try out the hand controller idea so he fitted a slot car control handle over the stick assembly of a stock single stick transmitter. He logged several trial flights with the company Ugly Stik and was happy enough with the results to keep the project alive.

In order to expedite the development of the first prototype I was given the task of casting up several hand controller handles, modifying the standard Kraft single stick gimbal assembly to accept stronger centering springs, and fabricating the first transmitter case. After several months of work and a trip or two to Vista, the first unit was ready for testing. Jimmy Whit had done his usual masterful job in installing the electronics. It required cutting the standard transmitter board into two sections, and squeezing it and all the other goodies into that small odd-shaped box. The airborne equipment was installed in my recently completed Nobler and readied for the maiden flight.

As most of you who have had the opportunity to fly the Nobler know, it is a very responsive plane when powered by a hot ".40". It was with quite a bit of anticipation that I readied myself for the first flight. The K & B fired up on the second flip and its loud stacatto bark did little to calm my now frayed nerves. As I taxied out to the runway at Whittier Narrows, my hand shook visibly. My good friend, Joe Howard, owner of Paramount Hobby, saw my plight and offered to trim the plane while I settled down a bit. Joe eased on the throttle and the Nobler jumped off into its usual brisk climb. Trimming took only a couple of passes over the field and Joe's expert hand had, by then, mastered the new configuration enough to try a roll or two before he turned the unit back to me. It was several flights before I felt at ease with the new rig. Turns were generally smooth and coordinated but the elevator had to be desensitized before I was happy. After the initial trimming and adjustments, the time for evaluation of the design began. The thumb actuated throttle control on top of the handle worked like a champ and was especially good in stalls. Ground handling with the hand controller was smooth and natural, even with a tail dragging Nobler. The antenna placement was out of the way and minimized the chances of bore sighting the airplane.

Subsequent weeks found several experienced fliers trying out that "strange box." Joe Howard and Walt Findlay's remarks were typical. They felt that new fliers may really like the configuration but most experienced fliers would probably prefer to stay with the modes on which they learned. The real moment of truth arrived on a hot clear morning outside the Kraft plant at Vista.

Cliff and I took the rig and the now well-proven Nobler down to the strip just below the plant. The strip looked small compared to Whittier Narrows as we cranked up the engine. I displayed my usual cool in such important moments and aborted the first takeoff by running off the edge of the runway. The second attempt was more successful and the little blue bomb roared off like it was looking for Pylon #1. She was a tad on the lean side but I managed a few ragged circuits of the field. By then Cliff and I had been joined by Phil Kraft, Doug Spreng, George Killeen, and a few others.

After Cliff wrung it out a bit, I took her back and started a landing approach. That landing strip looked really small then and to top it off the engine wouldn't idle down to its usual low rpm. There I stood, in front of Phil Kraft, world's champion pattern flier, with a plane that refused to land. He certainly was a patient and understanding host as I blew approach after approach. The engine died and with Cliff's help, the plane landed in one piece. The subsequent flights were much better and afforded Phil, Doug, and George a chance to really evaluate the new unit.

The configuration's one real weakness was by then evident. Coordinating the rudder and aileron on everything but normal turns took real concentration and inadvertent use of the rudder was common. Subsequent testing and changes have helped minimize these problems. Even though the present configuration was an improvement over the existing single stick models, testing will continue until all bugs are worked out.

It is encouraging to me that our hobby is supported by manufacturers and people who are receptive to new and different ideas. And even more important, people whose standards require a product to be proven by extensive tests and use in the field before being offered to the public. □

RCM visits the L.I.D.S.

1971 annual r/c contest

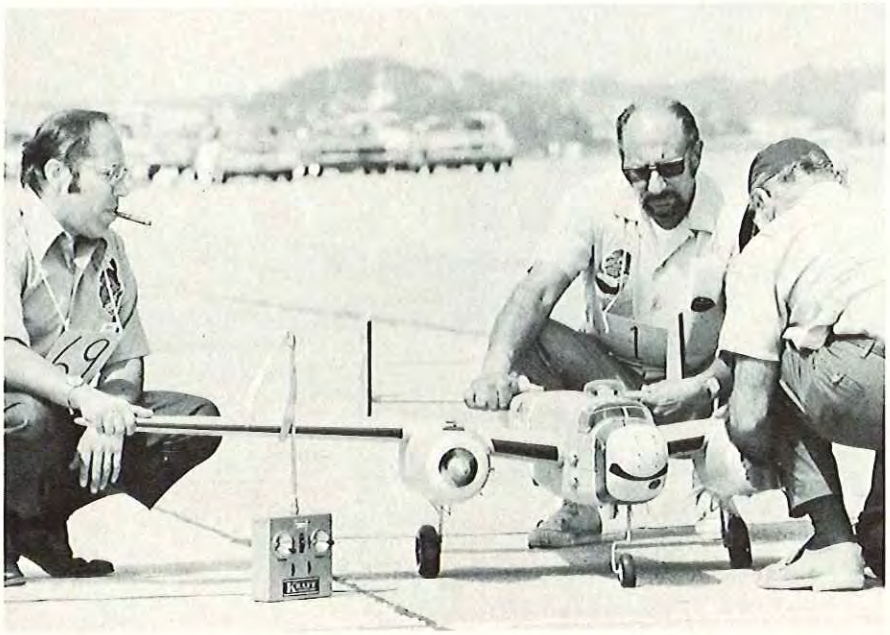
LONG ISLAND DRONE SOCIETY

ABOVE: A lot of attention was given to the scale helicopter built and flown by Horace Hagen at the 1971 L.I.D.S. Annual.

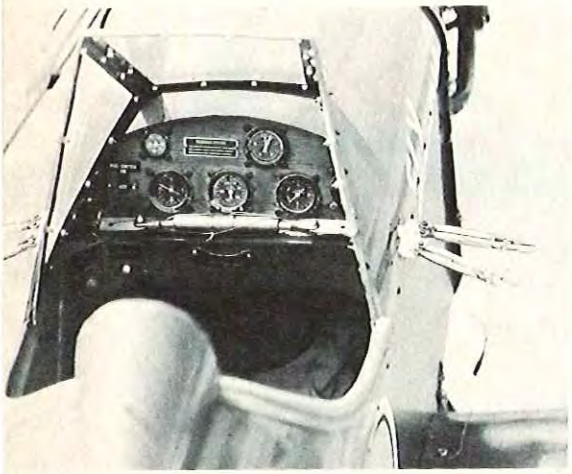
LEFT: Early morning registration at Mitchell Field, Long Island, N.Y.

Pattern winner, Jim Martin, making his way back to the pits. Jim is a flawless performer!

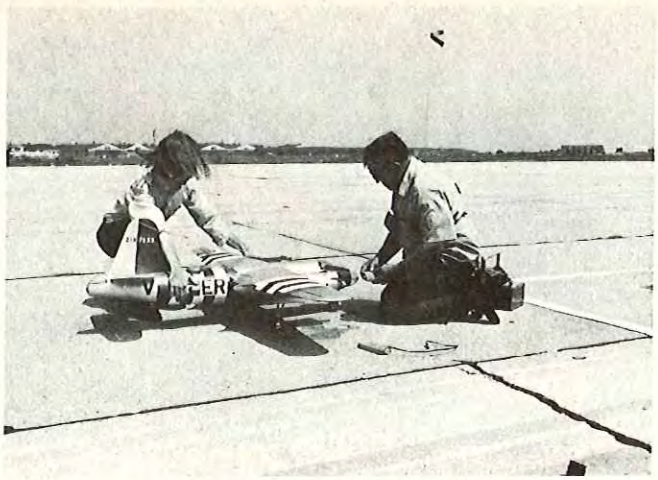
FAR LEFT: An 'instant kit' results from a mid-air. LEFT: Norm Harris' beautiful B-25 after losing one engine. ABOVE: Scale judges Al Van Wymersch and Al Holmes hard at work.



ABOVE: Mel Carner and Joe Cokes assists Norm Harris' scratch-built B-25 off before fateful flight. ABOVE, RIGHT: Internationally famous scale modeler, Walt Moucha, searches for his lunch in equally famous Fly Baby. Second in scale.



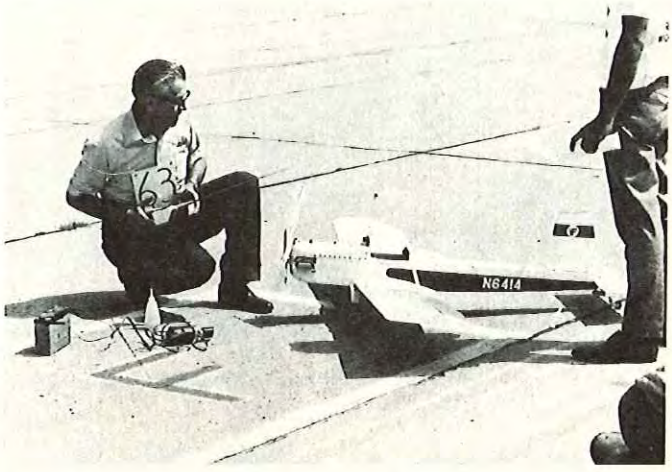
ABOVE, LEFT: Cockpit detail of Walt Moucha's Fly Baby. Note the chipped paint on the instrument frames! ABOVE, RIGHT: Walt, with the help of John Roth, gets the Fly Baby on its way to another winning flight.



Joe D'Amico checks rpm before another successful flight at 1971 L.I.D.S. RC Annual.

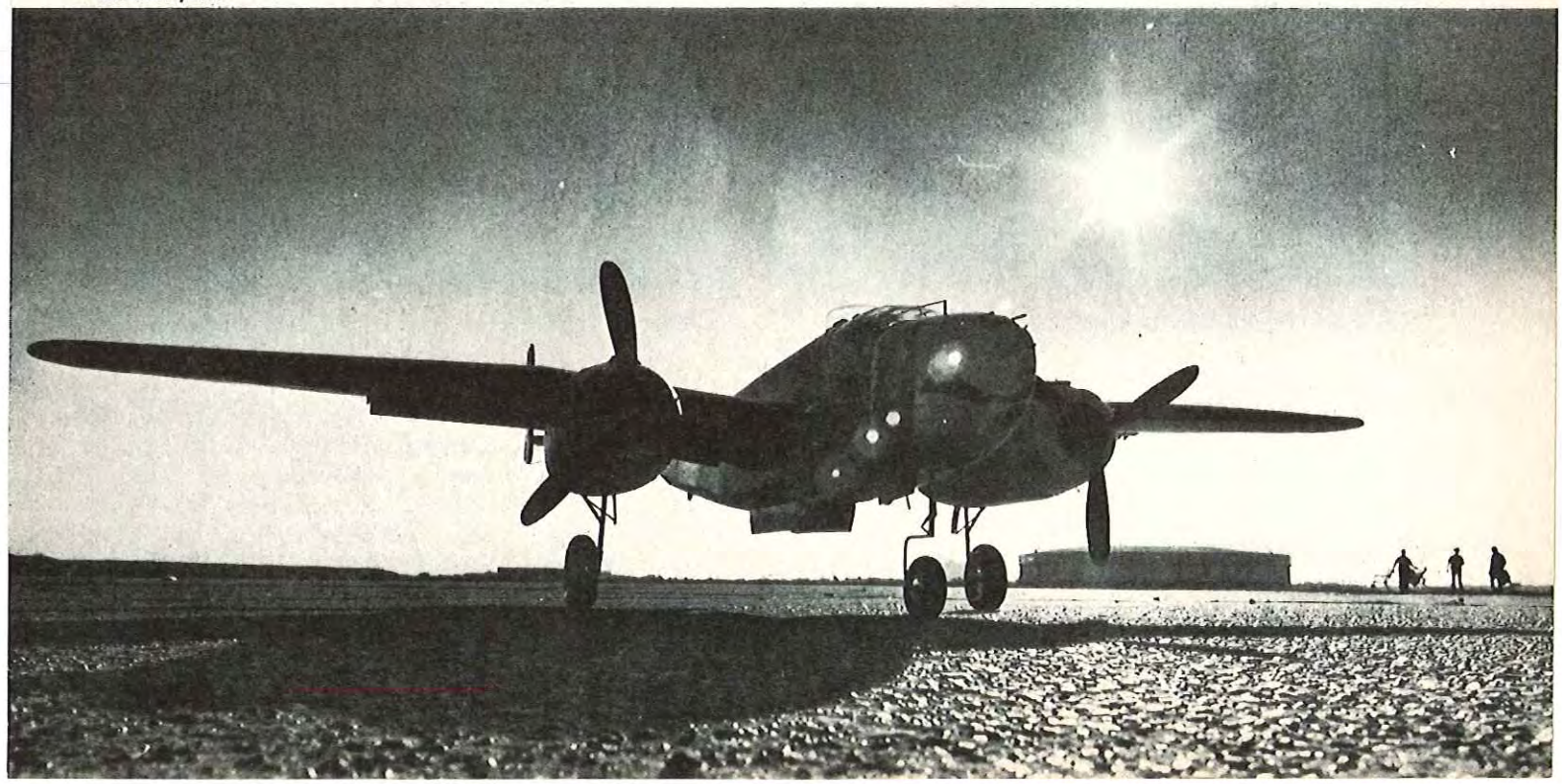
Leon Schulman and his scale P-51 receives some words of wisdom from 'Big Mo' Atun.

Charles Uht ('Mr. Guts') flew this highly detailed Nieuport 17 in pattern as well as scale!



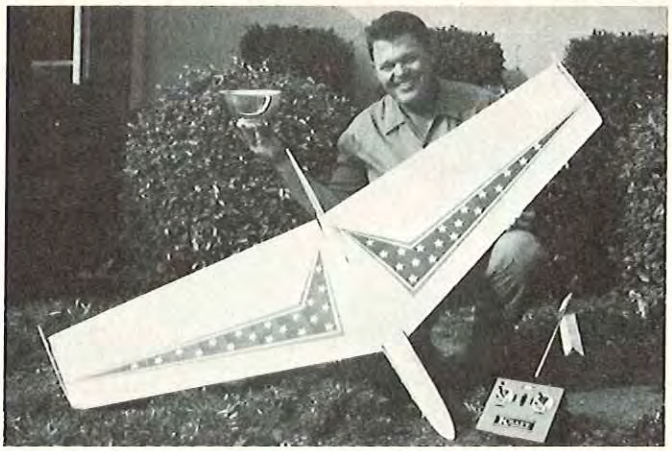
John Roth of Internat's fame, as well as all-around nice guy, with winning Volksplane.

. . . . and the 1971 L.I.D.S. Annual is now just pleasant memories for another year.



SOARING

WITH DON DEWEY



Ron Neal with his 1st place trophy for 1971 Northern California Sailplane Sprints. Ron designed Gryphon, available as a kit.

Youngest contestant, Alan Simpson, 2nd place at Omaha with Airtronics Olympic 99.

Paul Edmunds adjusts his Marks Models' Windward at Dodge Park.

Ray Brady of Omaha with his beautiful 3rd place Olympic 99.

Ray Hogan and his Graupner Amigo . . . seventh at Dodge Park.

The 1971 Marin R/C Northern California Sailplane Sprints started on a beautiful but discouraging Saturday morning. The wind was blowing 35 mph at 9 A.M. but 180 degrees in the wrong direction! At 2 P.M. the wind shifted 90 degrees parallel to the Thornton Beach Bluffs and, now, even the sea birds were confused. Everyone left by 3:30, tired of waiting, telling short and tall tales, and watching for the seagulls to stop their incessant flapping (which they never did).

All contestants returned Sunday morning, a day that was foggy and cold but the wind was right, not too strong, and at least coming from the right direction. At about 10:30 A.M., 6-8 mph winds coaxed off the first heat race and, by the time the second round was over due to soft winds and minimum lift conditions, almost 25% of the pilots had loft lift and had to land their racers on the beach below.

Spirits were running low, especially for the pilots with the big heavy ships, but by 1:30 the wind was strong, the

lift was up, and the race was on. Malfunctions, mid-air collisions, and pilot tension took a sad toll of airplanes, but the competition was strong and the sportsmanship unmatched, as competing pilots pit crewed, called pylon flags for their arch rivals, and helped each other repair their damaged racers.

When the smoke and debris drifted and cleared, the winners were Ron Neal in First Place with his Gryphon Wing, and Ken Willard and his MaxiSailer in Second Place. It is interesting to note that Ken had crashed the MaxiSailer in the first heat, breaking off both wing tips, but put it back in the air with the wings two feet short to place second for the heat, then he epoxied the broken tips back on and came back to finish second overall- - - that's some kind of guy! Third Place went to Bob Andris and a Perrigree while Paul Christian captured Fourth Place, again with a Perrigree. Second or Third Place was in the bag for Paul, but a heart rendering mid-air crash with John Baxter's giant KA-6 literally destroyed Paul's sailplane. A good time was had by all, but the question remains, "how did a 2 lb., 6 oz. Gryphon wing beat out the big, fast 5 and 10 lb. heavyweights?"

■

The first of what we hope will be many Sailplane Contests for area modelers was held in Omaha, Nebraska, on Saturday the 16th of October, 1971. This contest was held at Dodge Park (just north of Mormon Bridge on the west bank of the Missouri River) and began at one o'clock in the afternoon.

Jim Simpson was the Contest Director and, at the pilots briefing, he outlined the purpose, goal, and aims of this and future contests. The purpose was to illustrate the relaxed and pleasant atmosphere of a sailplane contest and to allow all participants maximum opportunities to fly. The goal was to build proficiency among sailplane pilots in the Omaha-Council Bluffs area to a point where they could aim at capturing National Team and Individual contests. FUN was the natural result!

There were 10 sailplanes entered in this first contest and only one winch was used yet they flew a total of 78 flights during the day. Twenty-eight of these were during the contest and the remainder included test, practice, and plain old fun flights.

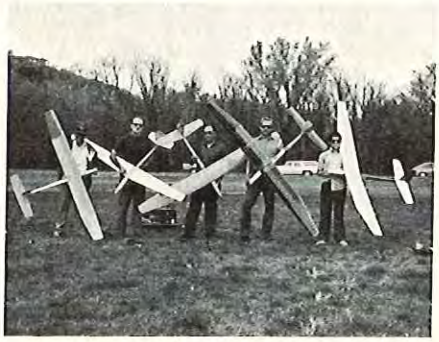
Floyd Richards was the registration official and timer. He had a most unique airplane with him which he flew a demonstration flight; a 12 foot wing span "T" tail motor-sailplane. He had a nose mounted Max engine swinging a single blade folding prop. This was the first flight for the folding prop and it seemed to work well as the plane went right up from the hand launch and, when the "noise" stopped, it flew like the rest! (Little dig for LSF!)

All of the contestants were LSF members, LSF aspirants, or were given applications for the LSF. Three of the planes were convertible to motor launch. James Dreier flew a Snipe from which he had removed a power pod, and both Doug Ferguson and Rod Sabacky removed props from their planes and flew off the tow. Incidentally, these two are 15 years old! Doug is Rod's instructor and, you might note Doug was fourth in standing while flying a cardboard covered foam sailplane with a propless engine on the front end!

The wind was about 10 mph when the events started and increased to above 20 mph as the afternoon wore on, providing some rather low times.

The following are the entrants and specifics listed in decending order according to point totals. Points were awarded on the basis of one for each second of flight and a 25 point bonus for each spot landing. All airplanes were Standard Class (100" or less).

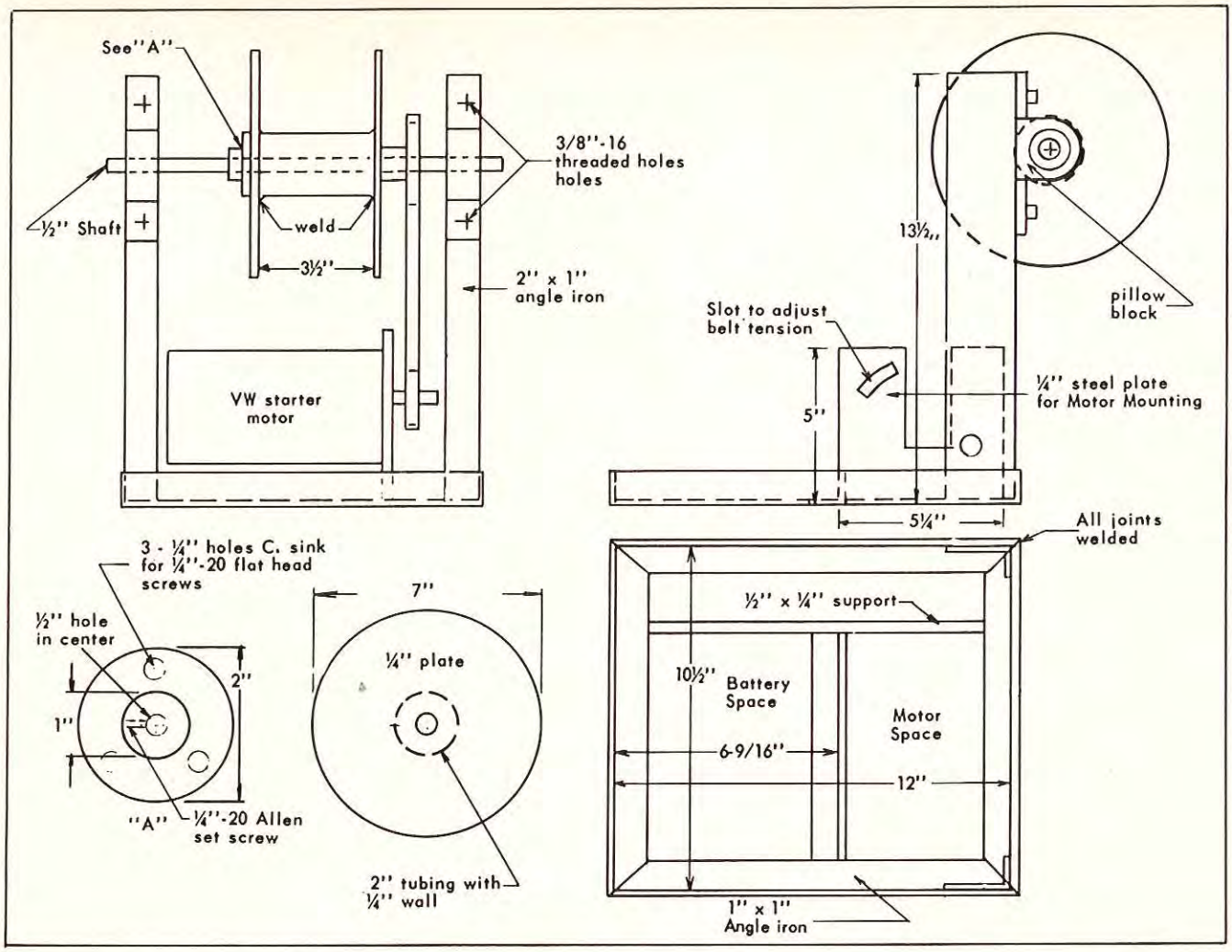
NAME	PLANE	TOTAL PTS.
Jim Simpson	Olympic	940
Alan Simpson	Olympic	515
Ray Brady	Olympic	483
Doug Ferguson	Original	390
Steve Wood	Monterey	337
James Dreier	Snipe	321
Ray Hogan	Amigo	297
Lynn Fehr	Mod. Malibu	146
Marvin Wilken	Olympic	78
Rod Sabacky	Hawk	29



ABOVE: Steve Wood of Monterey and first RC ship. BELOW: Lynn Fehr and modified Malibu.

ABOVE: A few of the early arrivals at Dodge Park. BELOW: Jim Dreier of Council Bluffs with Snipe.

ABOVE: Doug Ferguson, 15, with all-foam original. BELOW: Marv Wilkens with superb Olympic 99.



From the October issue of the ECSS Newsletter there was the following details for an electric belt driven winch by Albert Dalnoki, 5312 Clarewood St., No. 6, Belair, Texas 77036:

This winch has a lot of power and is very compact. I have built a dolly to make it easy to carry the winch to and from the car. You will find all frame material is inexpensive 1" angle iron while all joints are welded except the pillow blocks and the drum assembly.

The timing pulley at the drum is a Browning (Mayville, Kentucky) #30 XLB 037. This pulley has 30 teeth while the pulley at the starter motor has 18 teeth. The belt is 23" timing belt, U.S. Power Grip #230 XL 037. The Boston pillow blocks have a catalog number of 06902-3H.

The drum is made from 2" aluminum tubing with two aluminum plates welded to each side. The plate is 1/4" thick and 7" in diameter.

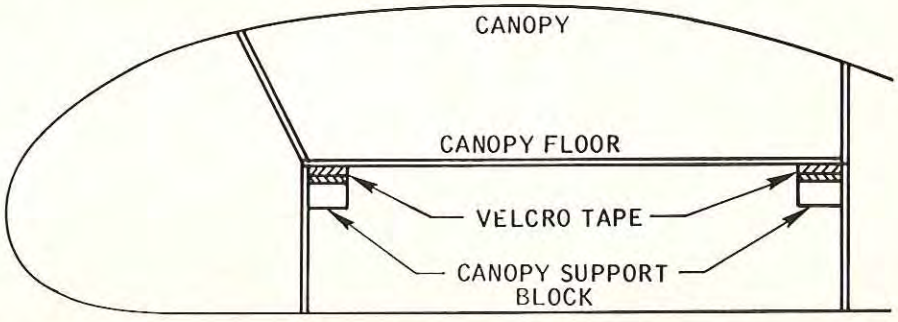
The electronic components consist of a 30 amp boat starter switch placed where it can be foot operated. A 6 volt solenoid starter switch is used from any old car which uses a 6 volt system. The battery is 6 volts and should be a heavy duty type to pull gliders all day without running down. The hardest job for the battery and motor to do is run a long time such as when you are pulling in the tow line at the end of the day. The starter motor is a 6 volt Volkswagen motor which I do not recommend because I had to make a bearing for the shaft. But the starter worked out quite well.

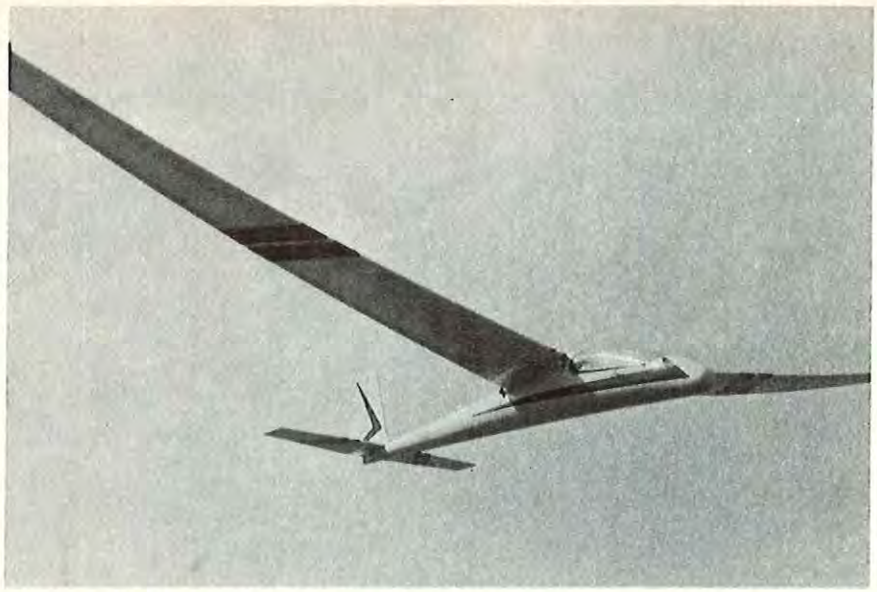
■

David G. Leach, 2124 Scottwood, Toledo, Ohio 43620, a member of the Toledo Weak Signals R/C Club, suggests that a very durable and attractive nose skid for a glider can be made from the hard rubber of protective body side moldings available from auto discount stores or dealers. This is available in many colors and can conform to any curvature with the application of heat. Most have a very strong adhesive backing.

■

Frank Koebel of 206 Union Street East, Waterloo, Ontario, Canada, remarks that if you find fastening glider canopies a problem, try some strips of Velcro tape (such as is used on clothing instead of buttons) glued to the front and back of the canopy floor. The Velcro fastener consists of two nylon tapes, one covered with small hooks while the other is covered with small nylon loops. Engagement of the two tapes makes a vibration and





The JP Models 'Dart', a quick and easy-to-build sailplane with plywood fuselage.

jar proof joint.

■

While we're on the subject of fastening canopies, here's another method from Kevin Flynn whose Specialist V design appears in this issue. The sketch is self-explanatory.

■

A new kit on the market is the Dart from JP Models, 26557 Mazur Drive, Palos Verdes Peninsula, California 90274. Ideal for the novice or experienced flier, the Dart is quick and easy-to-build and features a unique rugged plywood fuselage which is fully assembled and finished in white epoxy. The kit includes a finished fuselage with rugged fiberglass nose, complete hardware, painted pilot, shaped tail surfaces, decals, complete instructions, large R/C compartment, and a carton in which to store the wing. Specifications include a 100" wing span with a total area of 675 sq. in. The root chord is 8¼" tapering to 5¼" at the tip. Stabilizer area is 103 sq. in. with 51 sq. in. in the fin. Aspect ratio is 14.8 to 1 and the wing features an Eppler 387 (modified) airfoil. Weight, less radio, is 32 oz. and the wing loading is 8½ oz. per sq. ft., with an 8 oz. radio. The Dart was designed to be easy to fly and is a competitive performer capable of loops, rolls, and spins. When you bring it in for a landing it just floats lightly in. The Dart's rugged construction of a plywood fuselage with a fiberglass nose section and pop off wing will withstand the roughest landings with a minimum of damage. Available at your dealer or order direct, price is $44.95. The Dart is designed for tow launch, slope soaring, or for use with a power pod.

■

In closing, we'd like to finish off with a letter from Niclaus H. Marineau, D.M.D., 12755 S.W. 2nd St., Beaverton, Oregon 97005.

Dear Mr. Dewey:

As an enthusiastic novice to the art and fun of soaring, I read your column in the December issue with interest. My opinions and thoughts are therefore not from experience but from wonder.

THOUGHTS – – – – Information should be published concerning joining the LSF. Where and how much to send. My hobby shop doesn't know so maybe you can tell me. More information on glider kits available. I am now flying a Cirrus (Graupner) but where could I get information on the Kurwi series, or Osprey, Francis Products, etc. If my hobby shop can't give it to me, I should be able to find it somewhere. The only reason I got the Cirrus was that it was the only big glider he could get. How can I get in touch with Dale Willoughby to buy a kit if I can't find his address? I fly with a power pod for my Cirrus because it gets the plane up there in the green air the easiest, yet I don't read about power pods. Everything is winch, Hi-Start or slope. The area where I fly is relatively flat (no slope soaring) and so it seemed to me a big low sink dead air ship would be best, and the Cirrus seems to be fine. But are there others?

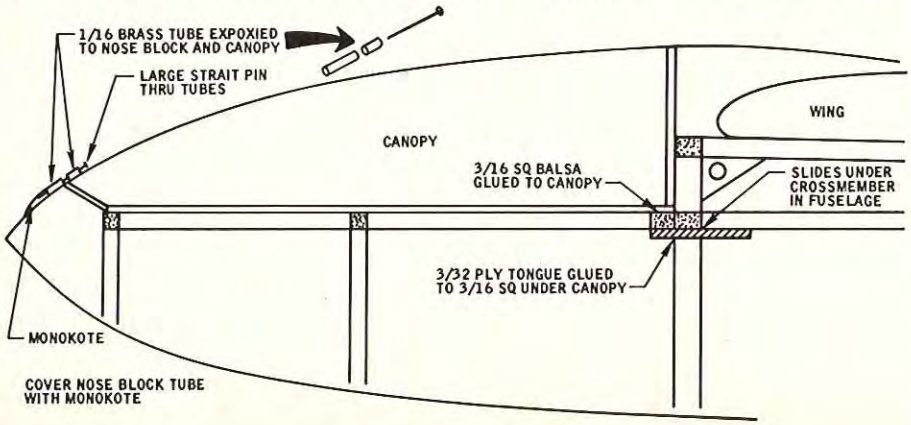
This whole jumbled paragraph leads me to think that there should be a magazine just for soaring. With information on kits, competitions, etc. A solution?

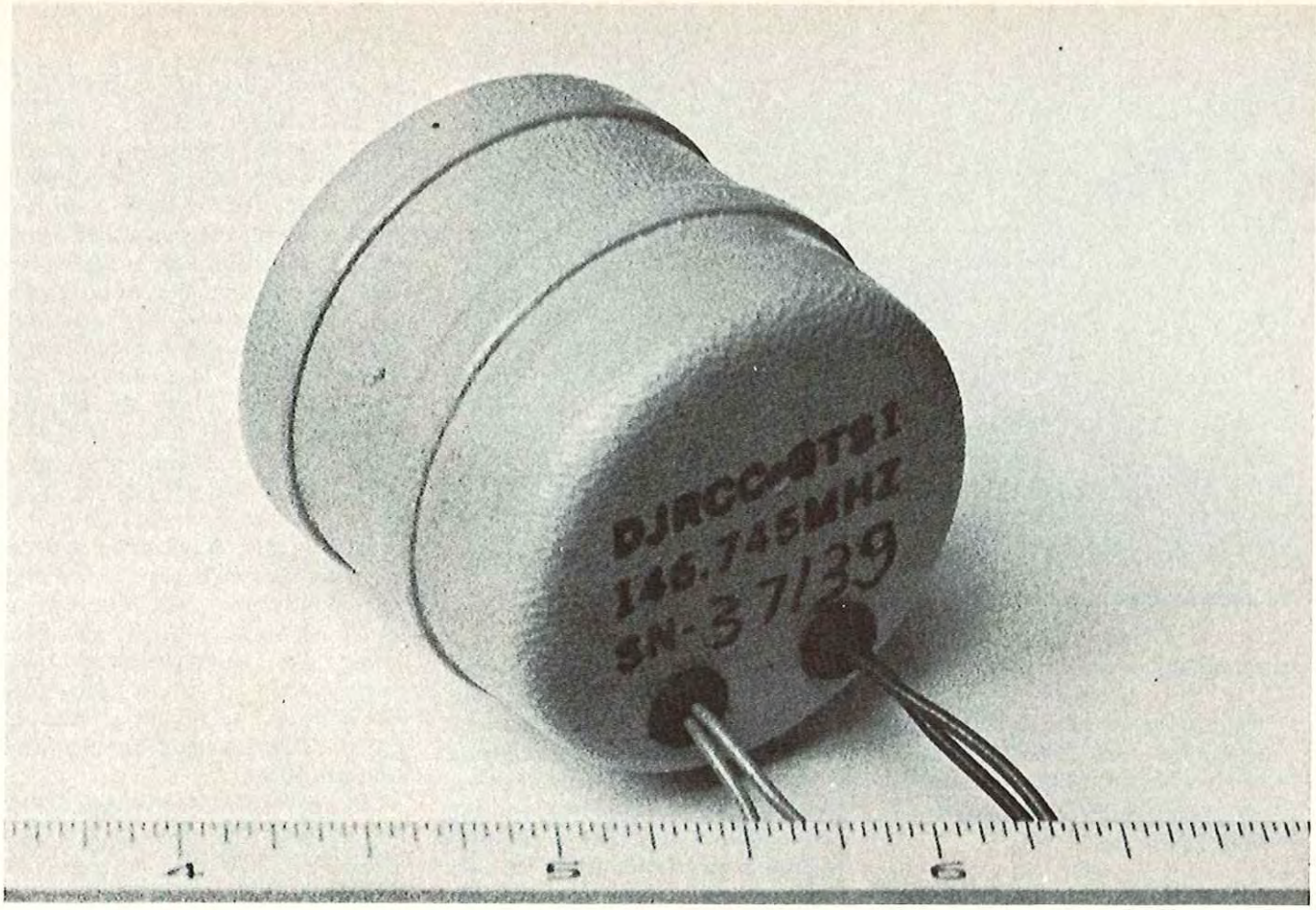
I agree with you on speed events. I can possibly see some thrill in slope soaring but speed would show me nothing. If I want to go fast I'll get a pylon racer. Gliders are for us lazy folks who like the challenge of seeing how long we can play with and against the elements and see how long we can "keep it up there."

Anyway – maybe you can see my problems, as I can see yours as expressed in your column. I may never get to a competition – just stay out in my wheat field and put it up there and watch it coast around. But, I would like to improve with more information expressed by knowledgable people like you and Maynard Hill, etc. You're thinking of "areas and many people and leagues," but I don't think that way until I get good enough to worry with you. I just need some communication from someone or someplace to get me good enough to start to worry on a bigger scale.

I really enjoy your column. I hope it doesn't get bogged down with administration and politics (for lack of a better word). Don't forget about we beginning soarers. We need your help also. Keep up the good work.

Sincerely,
Niclaus H. Marineau, D.M.D.



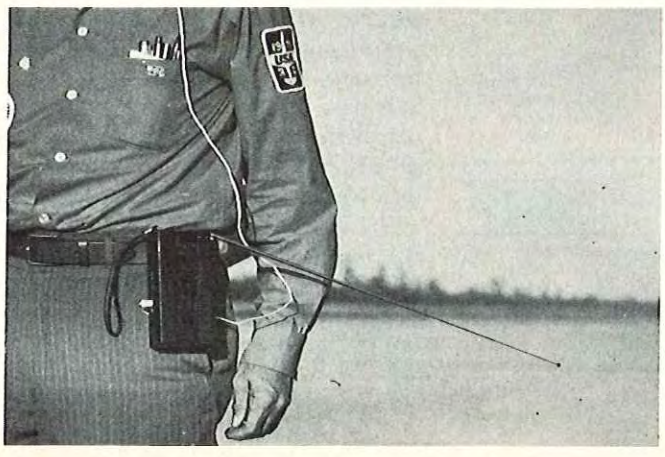


Model GTS-1 Thermal Sensor, distributed by Ace R/C.

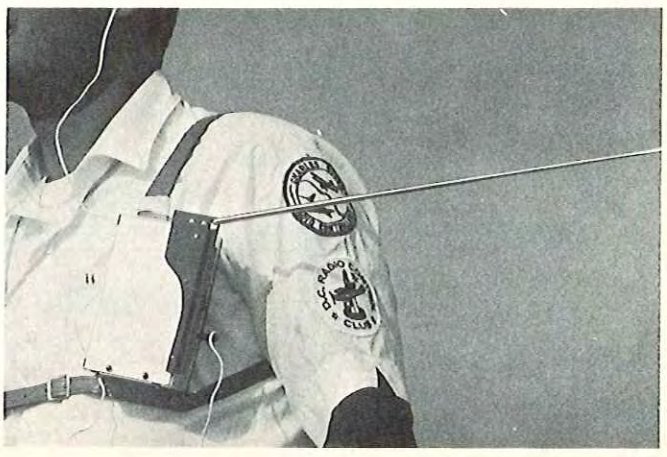
THERMAL SENSORS FOR SAILPLANES

BY DICK JANSSON

Lafayette 'police band' receiver (146-174 MHz) used with simple belt clip by Dr. Walt Good for monitoring thermal sensor telemetry.



Thermal Sensor monitor used by author (modified Layfette unit) and mounted on a "shoulder holster."



For a number of years an avid group of R/C glider fliers, generally centered within the DCRC group of Washington, D.C. have experimented with methods of providing the glider pilot on the ground with information about the rate of climb of his glider. Maynard Hill, of the DCRC, has published several articles on the subject. The means of communicating the altitude-rate-of-change information is most often a radio link. An R/C glider system is, therefore, composed of a command-control "up" radio link and a thermal sensor telemetry "down" radio link.

This all sounds pretty complicated, and under certain conditions it can be. Given, however, a well-proven set of equipment, the complexities can become transparent to the modeler. But is it worth all the trouble? And must a glider pilot have a thermal sensor to win a contest? The answers to the previous rhetorical questions are mixed with both yes and no responses. Let us examine the questions and the answers in detail.

At a sea level elevation the standard atmospheric pressure is 14.7 pounds per square inch (psi). It is a fairly trivial exercise to show that the pressure changes by about 0.00052 psi for every foot of altitude change. Such a pressure change is quite small, but there are several ways of measuring these pressures, especially when we are not interested in an absolute pressure value but in how fast the pressure changes. For instance, if a glider finds lifting air and rises at a rate of 3 ft. per second, the pilot would find the telemetered information of value so that he can keep his glider in the lifting air to maintain altitude and flight duration. To many pilots, therefore, putting up with the bother of the thermal sensor is worth the effort and expense. It is only fair to add that when a pilot is "shooting" spot landings for LSF Level I or II, the thermal sensor is of no value – I don't even bother with it at all.

Now for the question of competitive advantages – and there are those modelers who will claim that the thermal sensor provides an unfair advantage – many contests are won without thermal sensors. This is particularly true for flying areas that abound with vivid (and even violent) thermal activity; the trained eye can detect glider performance responses to thermals and take advantage of them. There are those other occasions where the lift is either suddenly, or predominantly, marginal, and the pilot has to work every second and every slight telemetered lift indication to make a suitable duration flight.

Author launches his Kurwi. Equipment shown includes small, lightweight gas-powered winch with foot controls; transmitter with extra sun shield and stop watch mounted on front; and thermal sensor monitor receiver mounted on a shoulder holster.

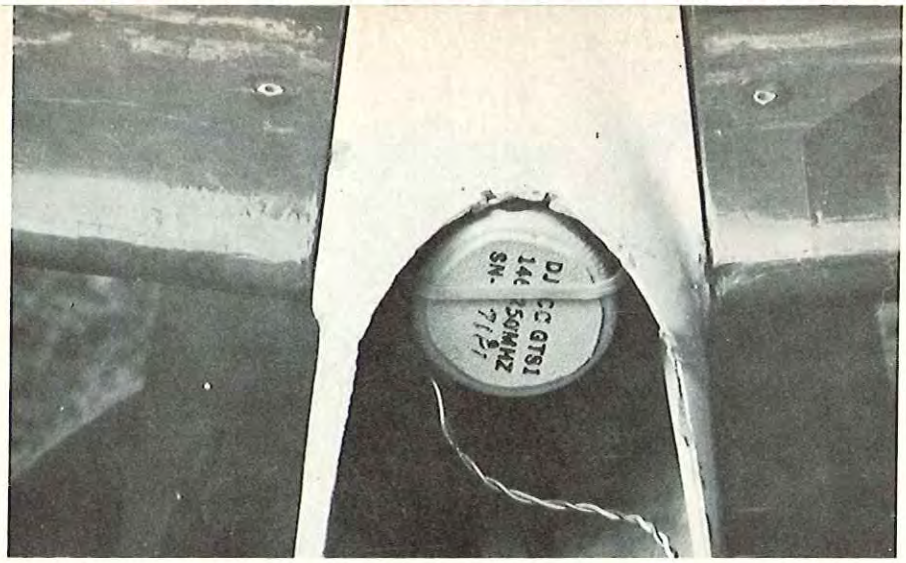
In New England we are generally blessed with marginal lift conditions, and when the strong evidences of lift are around – low puffy cumulus clouds – the sea breeze will come in and blow all of the thermal cells away before you can make much use of them. On the other hand, on moist hazy mornings a five-minute flight is not at all unusual at altitudes no higher than 250 ft. These conditions nearly always demand a thermal sensor. Travel south by 450 miles to the smiling lands of the Potomac River and behold fantastic thermal lifts all around by 9:15 A.M., so much so that being trained only on marginal lifts leaves one completely unprepared for real thermals. Here the thermal sensor is helpful but not an absolute must.

Even in this fine air modelers do have problems and I can attest that one flight, made in competition, found the thermal sensor handy as the air reverted to the marginality that was my training; a five-minute disaster was converted to a ten-minute maximum flight, and some of the finest modelers were not able to pull the same stunt.

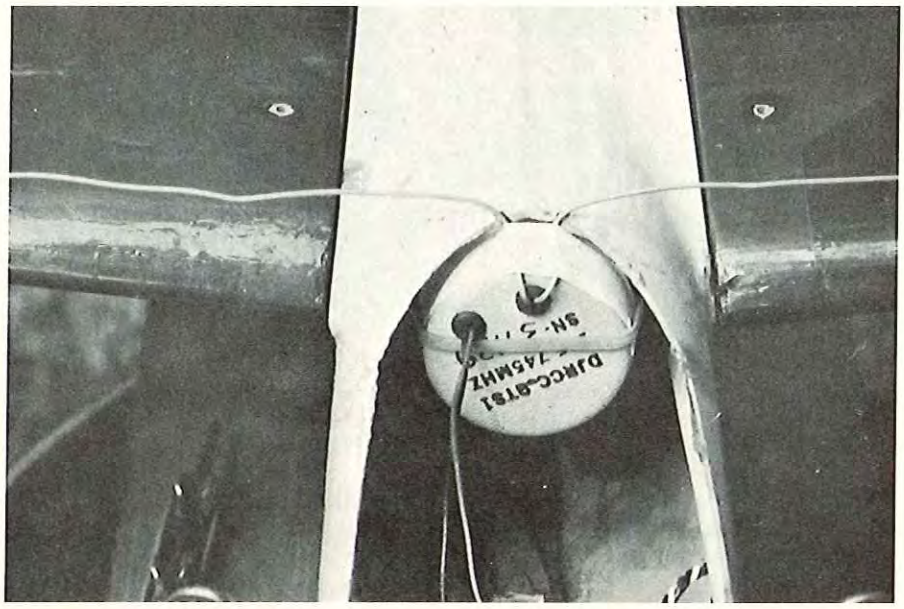
Controlling a glider with a thermal sensor is no different than one without a sensor. The pilot must determine the size, extent, and location of the lifting air and then help the glider in that air. A sensor may help in the determination but not in the control function.

Illustrated in this article is a thermal sensor that is being commercially produced; is operated on R.F. telemetry frequencies located in the 2 meter radio amateur ham band (144 MHz to 148 MHz). Telemetry information is received by a sensitive, but low cost, receiver as illustrated. The pilot will hear an audio tone that varies in frequency: if the tone goes up, his glider is also going up; and if the tone goes down, he had better look for a place to land.

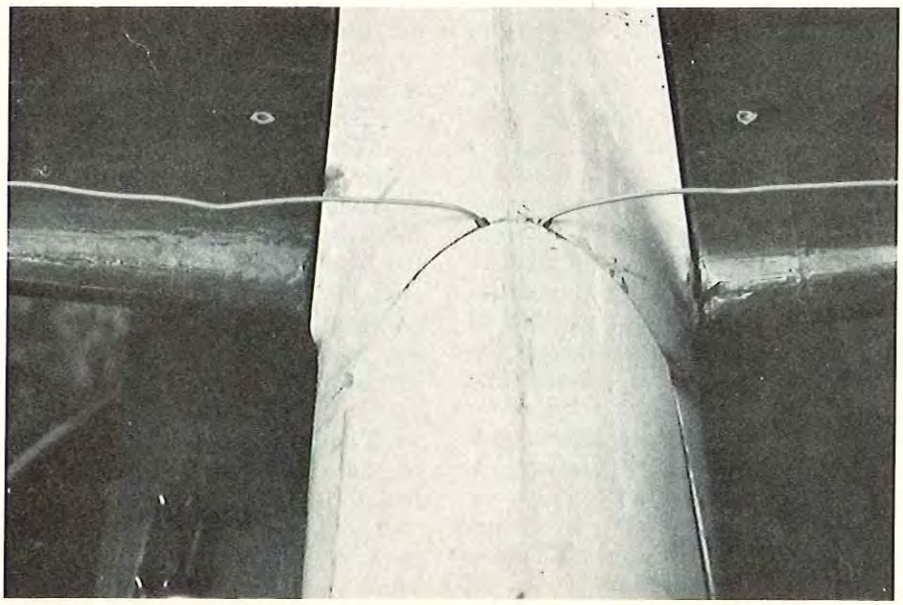
Numerous receivers have been tested with thermal sensors with good results on some and mixed results on



Thermal Sensor mounted into mailing tube (bonded into fuselage) and held with a band. Antenna leads (not seen) go to wing root connections.



ABOVE: Thermal Sensor showing wire antenna leads exiting at the edge of hatch. BELOW: Antenna leads exiting hatch edge through small notches.



others. The receivers that have consistently performed well are available from Lafayette Radio Electronics (part number 99-35313L) and from Allied Radio Corporation (part number A-2587). Both of these units have been reviewed by QST magazine in the March 1970 issue with results that are confirmed by actual practice. Sensitivities were found to be 0.15V for the weakest signals that could be heard and O.5V for solid signals. These kind of sensitivity performances cannot be easily duplicated with even rather expensive equipment and yet either of these receivers are available for less than $20.00.

Installation of a thermal sensor is simplicity in itself; extend the two 18-inch wires out along the wing panels directly opposite each other so that they form a dipole antenna (they can be Scotch-taped to the wing as illustrated). The red and black leads (furnished without a connector, as there are too many different types of connectors to try to match these days) should be connected to the plus and minus terminals of a nominal 4.8 volt (four cell) nickel cadmium battery pack. Using the command receiver battery pack is most convenient by attaching the wires to a servo connector and plugging the sensor into an unused servo receptacle. **Please be observant of battery polarity** – most transistors take great umbrage to reversed polarity power applications!

For more permanent glider installations a correctly sized section of mailing tube can be epoxied into the fuselage in the wing root area. Antenna leads can each be cut about 2 or 2½ inches from the sensor and using a size 4/0 dress snap connector to allow the longer residual antenna wires to be buried into the wing structure. If the wing is a "break-away" type, the snap connector will separate without undue strain; the photos illustrate the technique. **Be sure that the total length of each antenna lead is identical to that supplied with the sensor** – this is important. If you want to do this snap connector stunt to a foam wing, just use a proper length of 0.045 inch diameter music wire and poke it into the core in a spanwise direction.

As previously noted, the thermal sensor is providing a telemetry link on the 2 meter ham band, which nominally requires a FCC Technician License or better. The question has been asked of me many times: "Why not operate on the license free bands?" Unfortunately the answers are technically

very complex, but an explanation will be attempted. First though, the initial efforts were done on the 27 MHz License free band and with enough success to provide a contest win in 1970.

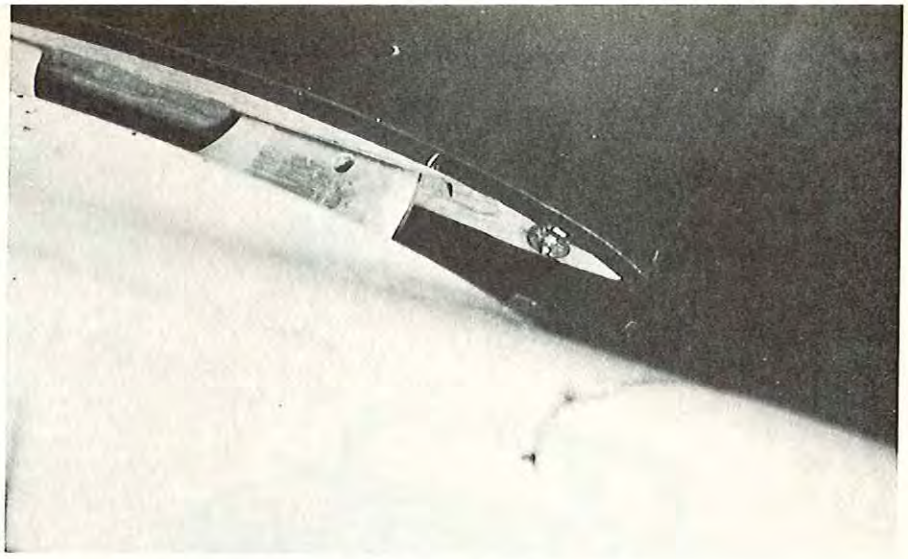
At the present time the FCC only allows license-free continuous communications from 26.97 MHz to 27.27 MHz. with less than 100 milliwatt power input to the transmitting stage, and with an inefficient single element antenna no longer than five feet total length (an efficient 1/2 wave antenna is 18 ft. long) as measured from the transmitter. Other low power license-free devices are allowed on other frequencies, but they are either very low powered or must be very intermittent duty cycle (garage door openers).

If we suppose that we can construct a telemetry unit on the 27 MHz band that does not significantly interfere with our command frequencies there, too (and this can be done), we face other realities. The 27 MHz band is very "busy" with all of the Class D citizens band communications, and the transmitting and receiving antenna systems are very inefficient for a low powered signal located a mile away and buried among all of the radio clutter. To partially overcome the antenna inefficiencies, the telemetry monitor receiver must be an exceptionally good one, so much so that it would market for more than $100.00 and still not be portable enough for the pilot to put in his pocket. In fact, the receiver antenna would have to be at least nine feet tall and staked to the ground, hardly portable!

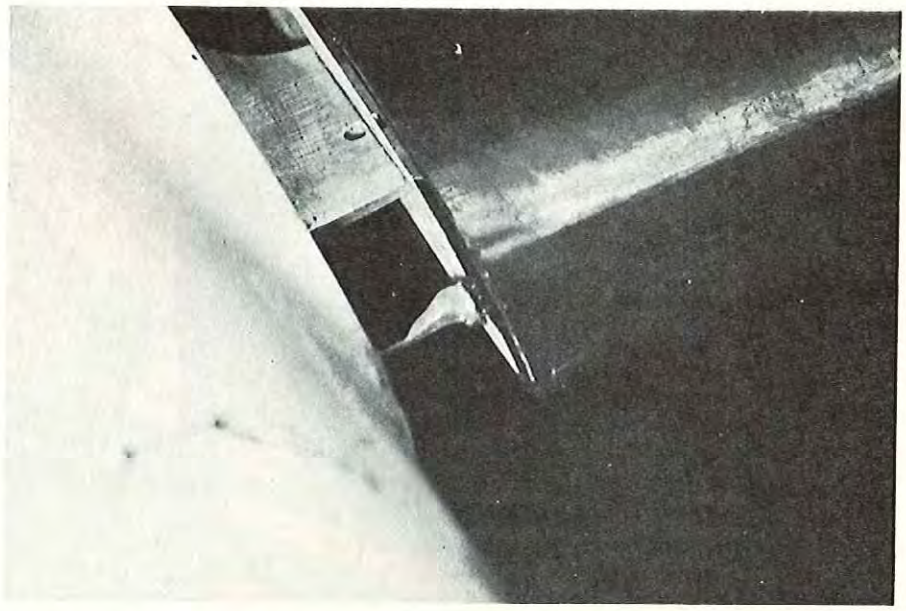
So, to make this long story shorter (as well as the required antenna), a much higher R.F. frequency must be selected. The 2-meter ham band is ideal as a basic 1/2 wave dipole antenna (the "yardstick" measure of all other antennas) is about 38 inches long in spread; this now becomes a physical and electrically efficient radiator of R.F. energy. In addition, there are several very sensitive low cost receivers available, and low cost silicon transistors are also available for use in the transmitter. The whole matter now can become a marketable reality despite the license requirement (and, after all, a businessman must deal in terms of marketable realities).

Typical radiated power output levels from thermal sensor transmitters are at an astounding low value of 3 milliwatt, yet rarely does the performance suffer from interference from ham communications. Despite this low power level, the sensor can be heard at nominal slant ranges of one mile; try to see your glider at that range! I have personally heard a sensor at a 4000 ft. range and others have done so up to 7000 feet, but I doubt that these devices can be heard much further. In other words, they don't add to the general R.F. spectrum clutter. In the future we may have the privilege to be able to operate these very low powered telemetry units on a license-free basis, but this would require FCC action.

There is yet one other technical avenue of approach to the problem and it would not require any license in excess of the Class C one needed now for flying. The system would use a technique of "transponding" where the command transmitter would send a normal frame of digital control pulses which would be received and used in the glider. In between the command frames the command transmitter and receiver would be momentarily shut off and a telemetry responder transmitter in the glider would broadcast a two pulse information data frame. A receiver at the command transmitter would detect the telemetry information and present it to the pilot. Thus, the command link and the telemetry link would share the same R.F. frequency alternating many times a second between them. This complicated operation, too, could be transparent to the modelers, all save the thickness of his wallet! □



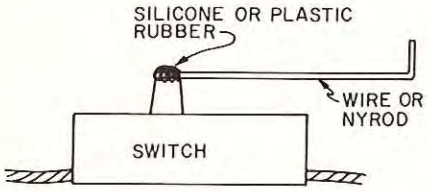
Close-up of dress snap antenna and connector built into wing panel.



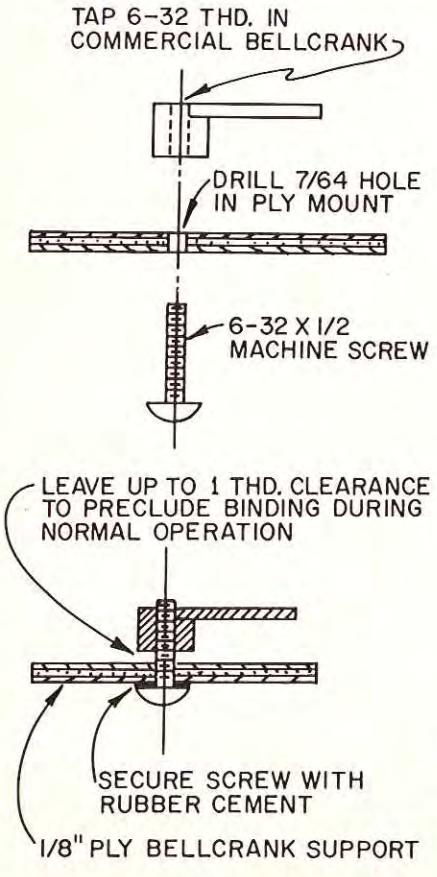
Antenna lead from Sensor connected to wing mounted antenna. Female snap has an epoxy anchoring of soldered wire to prevent breakage.

FOR WHAT IT'S WORTH

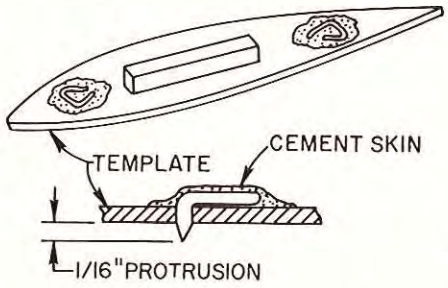
Instead of drilling a hole in your switch for internal installation, try this suggestion from Michael Jones, of Greensboro, North Carolina, of fastening the switch actuating wire or NyRod on top of the switch with Silicone rubber or plastic rubber. It's easier, quicker, and prevents possible switch breaking.



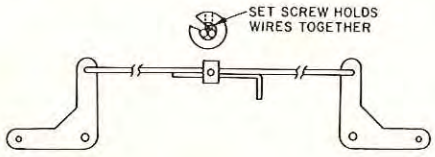
After six years of usage, Harold Hayes, of Torrance, California, has found the following method of installing aileron bellcranks to be easy to install, self-retaining, reliable, and most important, to have low friction with no backlash or "slop." First, make the bellcrank support out of 1/8" plywood. Then drill a 7/64" diameter hole in the pivot location. Install a 6-32 machine screw in the 3/32" diameter hole and secure with rubber or Silicone cement. Next, tap a 6-32 thread in the pivot hole of the bellcrank. The existing hole in the commercial bellcranks that Harold uses is the proper size for a 6-32 thread. Wind the bellcrank onto the 6-32 machine screw. Be sure to leave a 1/2-to-one-thread clearance between the boss of the bellcrank and the plywood support so that the joint will not bind up during normal operation.



For a quick and neat rib template, try this idea submitted by Fred Deudney, of Devon, England. Cut your rib template from 1/16" hard balsa or plywood and cement bent pins to it as shown. Add a strip of 1/4" sq. balsa so that you can lift the template off the wood being cut. Harden the edges with a smear of white glue, burnished when dry. The latter greatly reduces the risk of cutting into the template. For a permanent job, coat the edges with polyurethane paint or varnish and your balsa knife will just skid around without digging in.

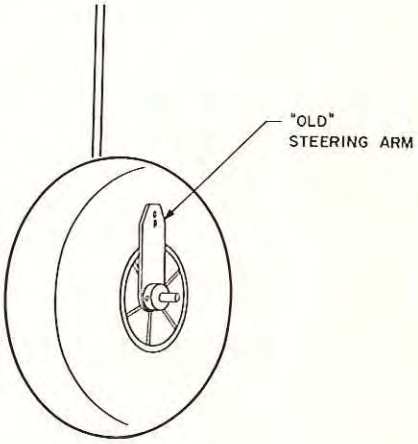


Mike Miles of Durham, North Carolina, suggests an easy way to make a quick aileron hookup. Simply cut a section from a 5/32" Du-Bro wheel retainer and use it in this manner. This method allows easy adjustment of aileron neutral since the set screw holds the wires together.

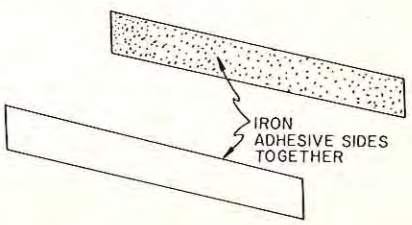


If you are tired of ending up with a melted glob of nylon every time you try to attach a nylon clevis to a brass cable for a throttle linkage, try this idea from Mike Fallon of Richmond, Indiana. Instead of using solder, next time try epoxy. The epoxy bonds quite well to the braided cable and makes a wonderful plug that will never pull out as some soldered ones will.

If you need a little drag on your wheels for a short field, this trick seems to do the job quite well. Dan Harrison of Palmdale, California, suggests that the tension adjustment is made by simply adjusting the set screw and sliding the steering arm on the wheel axle.

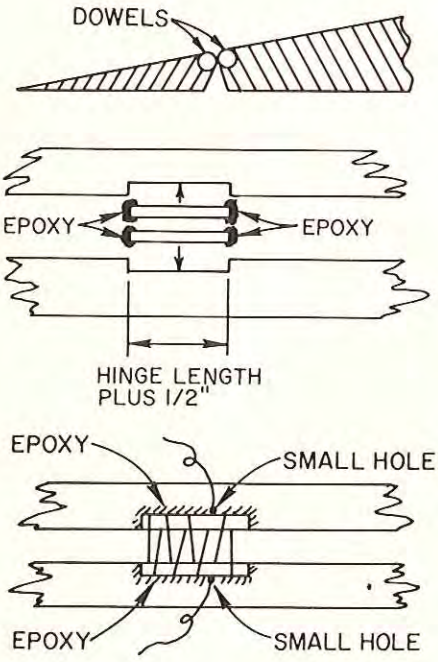


James Stephens, of Nashville, Tennessee, writes that, being a beginner, more or less, he still has a problem of keeping oil, dirt, and other accumulated mess of of his equipment, especially the frequency flags on his transmitter. So here is Jim's suggestion for another great use for Super Mono-Kote that eliminates rigorous washing and ironing of frequency flags. All that is required is two or four pieces of scrap Super MonoKote, depending upon whether you fly on 72 or 27

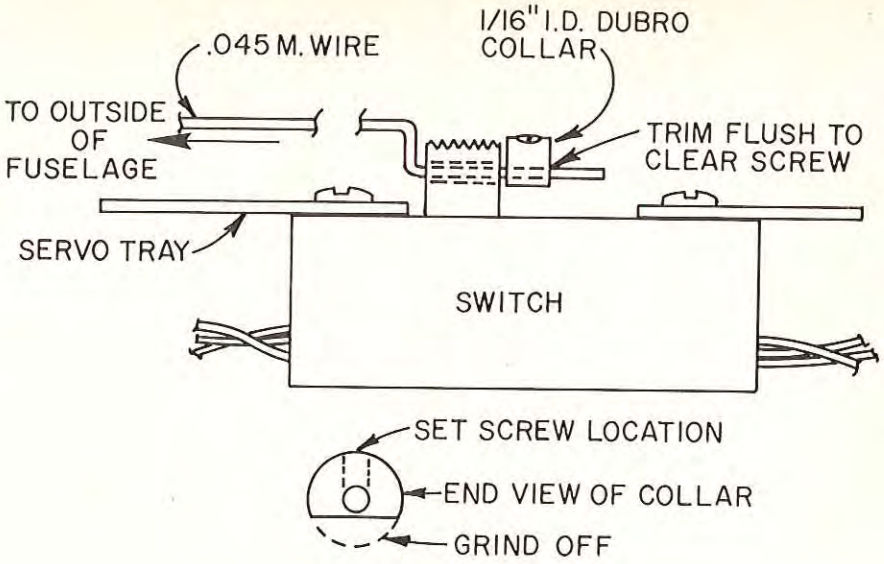


MHz. As shown in the sketch you will find that they make the most useful, durable, and cleanable flags around.

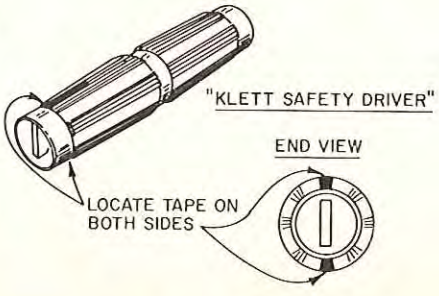
It has been known for many years that thread hinges are a quick and functional way of fastening control surfaces to the wing, rudder, and elevator as well as being completely "no-bind" hinges. In the past, however, they have had a tendency to be weaker than other types and have never seemed to be used effectively for "barn door" ailerons. Here is a solution from Bill Llewellyn of Kirkwood, N.Y. First, using a piece of dowel of the same diameter as the control surface thickness, cut two for each hinge one half inch longer than the length of hinge required. Notch the control surfaces for an exact fit. Epoxy only the tips of the dowel, insert, and let set up. Next, sand the edges of the surface to the contour of the dowel. Build a small hole and thread your hinges, adjust the surfaces, and then tighten. Epoxy the back part of the dowel and surface making sure not to let glue get between the surface edges. This method can also be used for surface hinges on ailerons.



Capt. Tom Walker of Vandenburg AFB, California, submitted a couple of ideas he's used for several months with considerable success. The first is not an original one, but an improvement on an old idea. Many modelers use the method of drilling a hole through their on-off receiver switch and soldering washers on either side of the switch. This struck Tom as a bit bothersome, particularly if you swap equipment between models frequently, not to mention the possibility of damaging your switch lever with the soldering iron. Tom solved this problem by bending a "Z" in the .045 wire about one inch from the end and slipping it through the 1/16" hole drilled through the switch. The other end is secured by a 1/16" I.D. Du-Bro wheel collar that has had a flat ground on the side opposite the set screw. This will permit the collar to clear the servo tray. The wire should be trimmed flush with the end of the collar to prevent hitting the screw which retains the switch to the board. The sketch should show this more clearly.

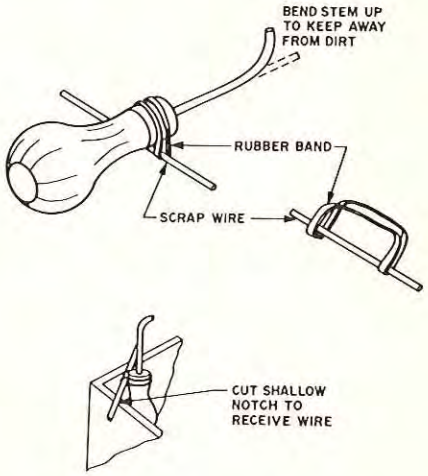


The second idea which has been extremely helpful concerns using the new Klett Safety Driver. Tom found it difficult to quickly tell which end was for the round head bolts. Also he had trouble engaging the driver in the bolt slot once he found the proper end. Both of these problems are solved by putting two small strips of MonoKote or vinyl tape of contrasting color on the end frequently used and in line with the driver blade. This will enable you to engage the bolt quickly and accurately. By putting the tape or MonoKote between the ridges, it is not easily dislodged. Again the sketch should be self-explanatory.



If you are looking for thermal shrink tubing in 36" lengths try your local electronic supply store which has it available in black or white at a $1.35 per length. This idea was submitted by R.L. Anderson, of Abilene, Texas.

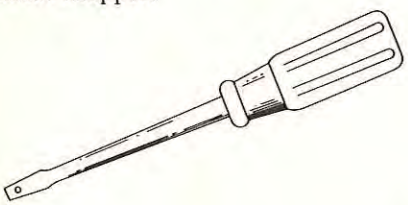
If you want to keep that familiar fill and prime bulb stem from rolling around and collecting dirt, simply attach a short length of 1/8" tubing or wire to the neck and bend the stem to point upward. The bulb can be placed upright in the corner of the field box as well by using a piece of scrap wire secured around the neck. This idea was submitted by Dave Katagiri, of Seattle, Washington.



J.L. McVey of Roanoke, Virginia, has his own method of installing 2-56 studs in NyRods. You might like to try this one out. Clamp the NyRod in a vise and chuck up the 2-56 stud in a plain crank hand drill. Presto - - - faster than it takes to tell about it. This method will also remove 2-56 studs in a hurry.

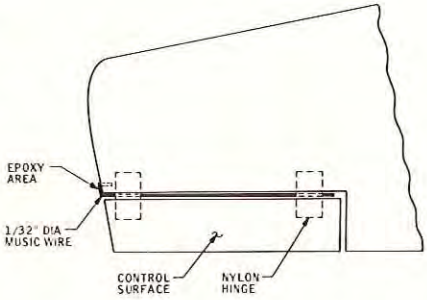
Finishing the wood under the canopy or in the cockpit area of a model was always a time consuming problem and required extra planning. So Clark Kreitler of Clyde, Texas, hit upon a quick and attractive substitute. Clark now cuts pieces of felt cloth or vinyl material and glues these pieces to the fuselage prior to attaching the canopy, thus getting an instant finish and a good looking interior. These materials are available in fabric stores in small economical quantities and an infinite variety of colors and shades. Picture, if your imagination can stand it, the large, mature male R/C modeler shopping in that female lair, the fabric store. It sure draws the giggles and stares and is lots of fun if you have the nerve.

As John N. Membrino, of Berwyn, Pennsylvania, suggests, who among us hasn't lost blood, flesh, or bones from our spinning prop, trying to get that last few rpm's out of a needle valve adjustment? John hasn't; not since the first time, anyway! He simply drills a 5/64" hole at the end of an old screw driver. To adjust the needle valve, he simply slips the hole over the bend end of the needle valve and adjusts away – several inches away from that meat chopper!



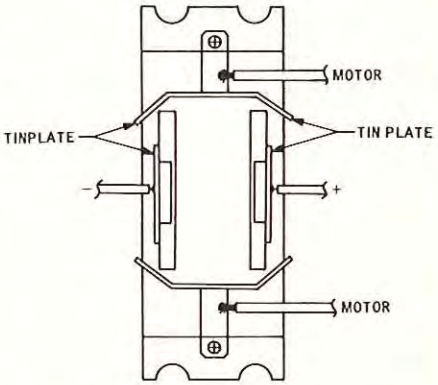
If you want to make personalized decals from Super MonoKote or Solarfilm, make a template of 1/8" plywood of your final design. Smooth the edges well. Put two coats of rubber cement on the bottom side which will prevent the material from slipping when cutting it with a sharp razor blade. Decals may easily be attached with an iron. This idea was submitted by J. Topf, of Vernon, British Columbia, Canada.

Most modelers would probably like to remove their control surfaces occasionally for cleaning, repairing, repainting, etc., but find it very inconvenient to destroy hinges and replace them. Andy Wilson, of Los Alamos, New Mexico, uses a simple technique that affords easy and rapid access to the control surfaces and has worked extremely well for him. Andy takes the standard Du-Bro type nylon hinges, removes the permanently installed flat-ended hinge pins, and drills through the existing 1/32" diameter molded hinge pin hole with a #62 drill (0.038" diameter). He then uses a full length hinge pin that spans all hinges on the control surface, using 1/32" diameter music wire for the pin. One end of the hinge pin is usually folded 90 degrees, or to the surface contour with a second 90 degree fold pushed into the structure and spotted in place with epoxy for easy access when removal of the pin is desired. Two additional benefits, here, include a near frictionless hinging method which can be kept that way by occasional disassembly and cleaning and, secondly, the one piece hinge pin is a great aid in the initial installation of hinges by assuring good hinge alignment while the hinges are cemented into position. Obviously, individual hinge pins can be employed also, each with a folded end to secure it with epoxy, etc. Andy has used this technique also but the single hinge pin per control surface works best for him.



As an A & P mechanic, Thomas Zaloga, of Bellevue, Nebraska, has come into contact with many materials which he as used quite extensively in R/C. The best, so far, is an aircraft covering called "Razor Back." This is a fiberglass cloth impregnated with butyrate dope. When applied, using butyrate dope, and given enough coats to fill the weave, it takes on the strength of regular fiberglass cloth and epoxy but with much less mess. Tom has used it to wrap landing gear struts and tail wheels, to hold wing halves together, and to reinforce engine struts. Tom is sure that you could find many more uses for this material, and a quick trip to the local airport could turn up some scrap pieces. Another source would be your local aircraft materials supply dealer.

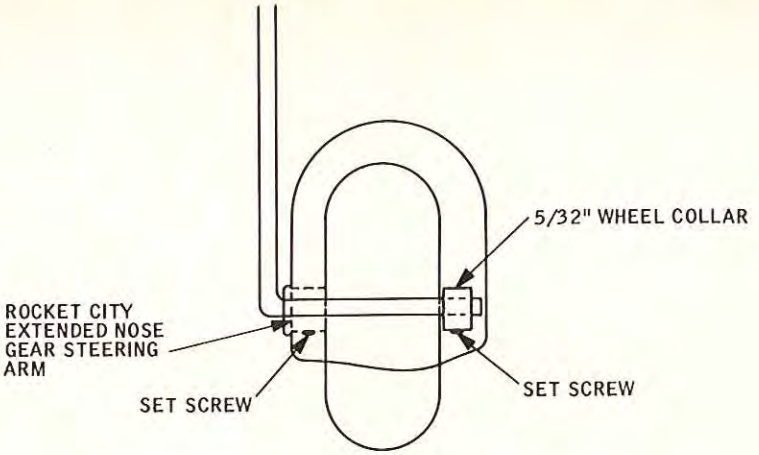
Larry Hoffman, and his son, of Tokyo, Japan, recently reworked one of his sons battery operated cars and fixed proportional steering to it. Not satisfied with just going forward, Larry worked out the modifications shown on the sketch to his Logictrol servo to give forward, reverse, and stop positions by adapting the servo as a reversing switch. Larry used tinplate for contacts and, by bending the plate as shown, servo loading is minimized. Also, the contacts are self-wiping. This can easily be worked out for rotary output servos by attaching a couple of small screws to the output horn in a perpendicular position and mounting tinplate contacts on either side of the servo. This simple system has given Larry and his son hours of fun at home when weather cuts down their outdoor modeling activities.



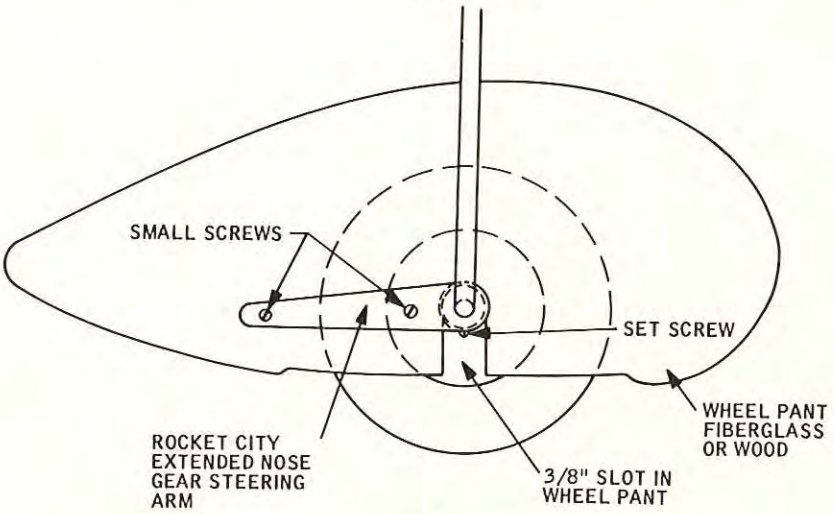
The next time your model calls for fabric covered control surfaces and you have a sheet balsa surface, this idea from Jerry Smith, of Mishawaka, Indiana, may help you. Before applying MonoKote, neatly wrap 1/16" white striping tape, as shown, to the appropriate control surface. Be sure the tape is straight and in line with the wing or stab ribs. Seal the edges of the MonoKote firmly with an iron and shrink with a heat gun. Be careful not to let the MonoKote stick to the wood between the tape strips.

Don Williams, of Phoenix, Arizona, writes that for a long time he had trouble with wheel pants fitting to wire type landing gear. Either the soldered mounting plate would be crooked or there were problems getting them on or off. After building a Stafford Chipmunk, Don kept delaying putting on the wheel pants for the reasons he mentioned until he came across a Rocket City Extended Nose Gear Steering Arm. The idea seemed worthwhile to use as a mounting device for the wheel pants, so he tried it and it worked quite well. No soldering is needed. Simply tighten the

set screw. The added advantage is that the wheel pants may be removed by loosening two set screws – one in the steering arm and one on the outer wheel collar. The entire assembly will slip right off the axle and will slip on again with just as much ease. You may adjust them at any angle you want by simply loosening the set screw and retightening once again. Two small screws are all that is necessary to mount the wheel pant to the arm. The only modification to the wheel pant is to cut a 3/8" slot to accept the collar on the steering arm and drill holes to accept the small screws on the arm itself.



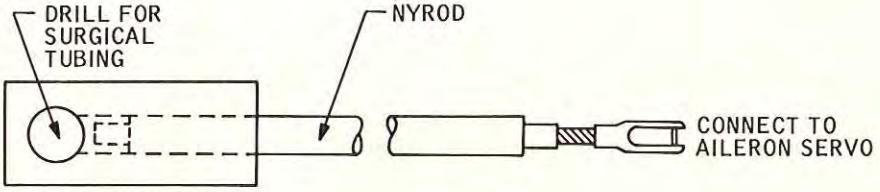
FRONT VIEW



INSIDE VIEW

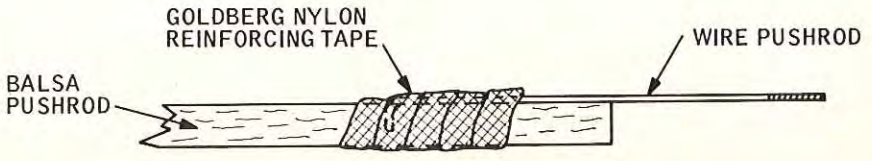
If you've had epoxy glue run into your plastic or nylon hinges, try folding the hinge as far as it will go and dip only the pin area into hot parafin wax. Then remove from the wax and fold the hinge out flat to cool. The hinge can now be epoxied into place with no danger of soaking up the glue. Try not to bend them until the epoxy sets. The wax will flake off when the hinge is worked leaving it completely free. This idea was submitted by Peter Sindel, of Foresthill, California.

A simple fuel shut off device for R/C combat was submitted by Sid Kauffman, of Durham, North Carolina. This device had to be one which would not be triggered by a momentary glitch. A piece of 3/8" square hardwood is drilled through for a piece of surgical tubing. A hole is drilled from the end for an outer Nyrod. The Nyrod is epoxied to the block and the block is fastened to the motor mount. The tubing from the tank to the engine is passed through the block. The nyrod is connected to the aileron servo so that sustained full right aileron (victory roll!) pinches off the fuel line.

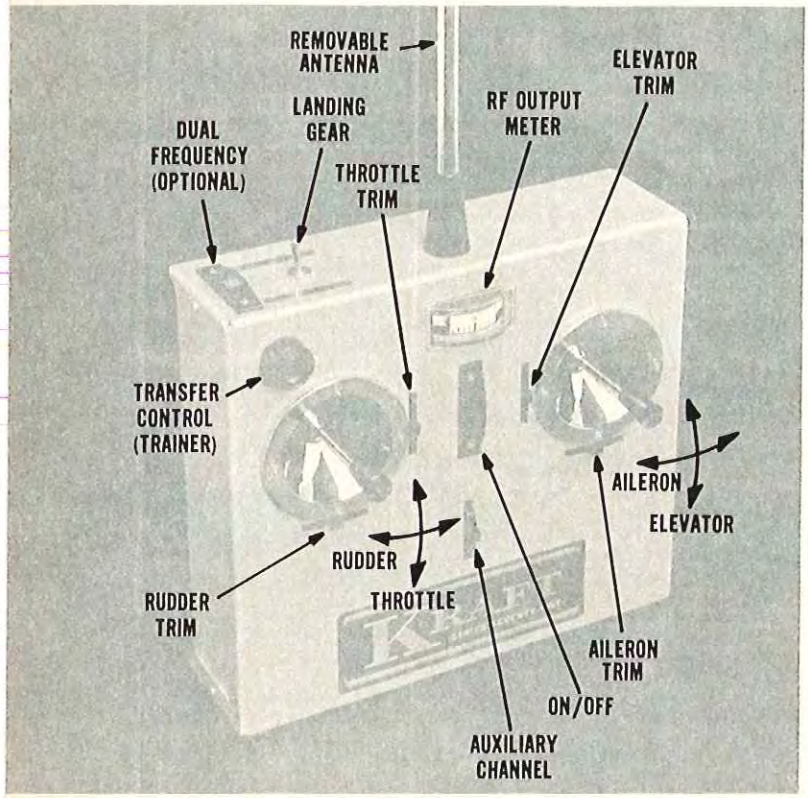


Melvin Carber, of Oceanside, Long Island, N.Y., suggests using a three by five inch ruled file card as an inexpensive throw away place on which to mix epoxy glue. The rules also make it a great help in making sure that Part A and Part B of your epoxy are mixed equally. Simply lay the glue between the lines of the card, in equal lengths and widths, using the blue lines as a guide. Also, an excellent mixer for the epoxy are coffee sticks sold at restaurant supply houses for about $1.00 per 1,000. The stick, when left on a card after use is a good indicator of the epoxy being cured. Then the card and stick can be thrown away.

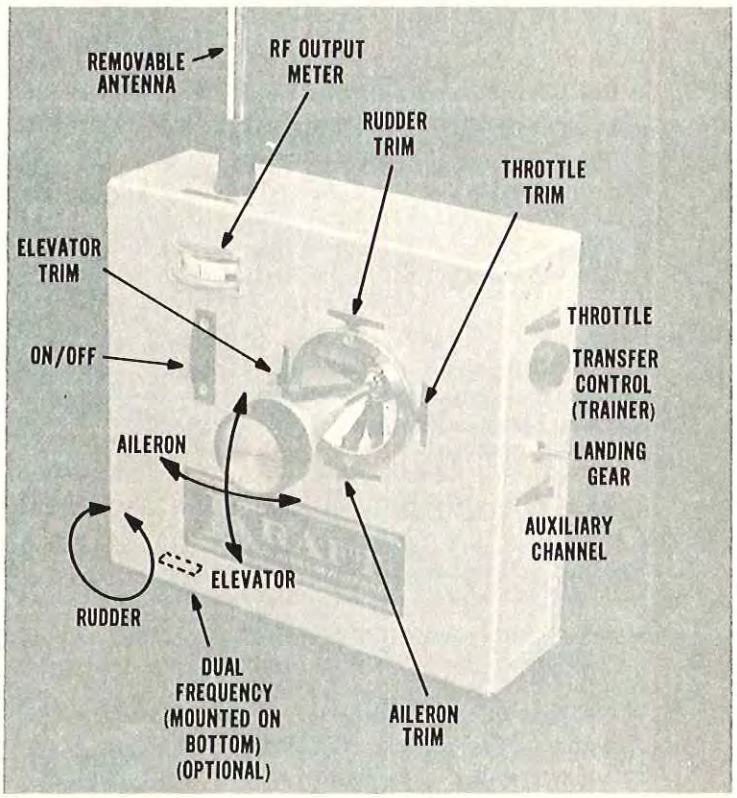
Edward Kuramoto, of Honolulu, Hawaii, suggests using Goldberg Nylon Reinforcing Tape to attach the wire end to the balsa pushrod. The resultant job looks neater and the pushrod will not break at the hole. Coat the nylon tape with regular model cement, not white glue or epoxy, and allow it to dry. Add another coat of cement to the tape and wrap it around the pushrod in an overlapping spiral, starting just before the hole for the wire and continuing over the wire. □



FLIGHT TRAINING COURSE



A typical six channel, two-stick transmitter. Mode II shown. On Mode I, throttle and elevator are reversed.



A typical six channel single stick transmitter configuration.

CHAPTER V

TRANSMITTER STICK CONFIGURATIONS

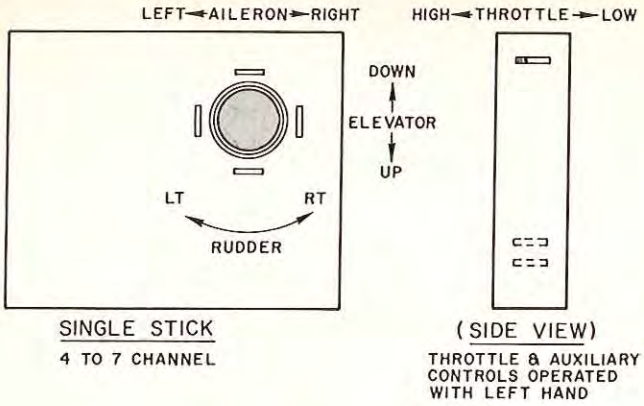
Once you have selected the brand of equipment you wish to purchase along with the number of channels you desire, and, again we recommend the four channel system, the next obstacle to overcome is the stick configuration you wish to use. Since you have no previous experience in radio control, it will be a difficult decision for you to make. There are three basic configurations which are called Mode 1, Mode 2, and Single Stick. Another problem with which you may be confronted is "what do I do if I'm left handed?"

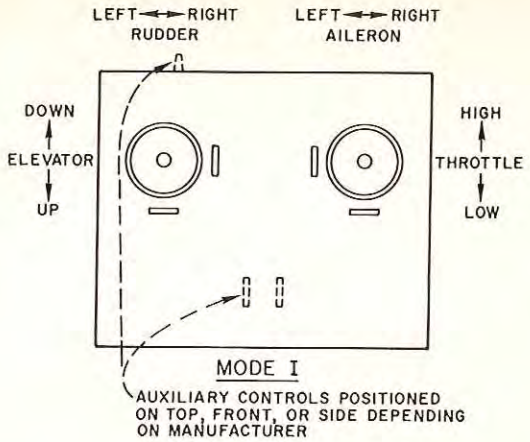
In the early days, Glen Curtis shifted his body weight and his waist-attached wires left to bank left; right to bank right. His early ships and their control systems are on display at the Curtis Museum in Hammondsport, New York.

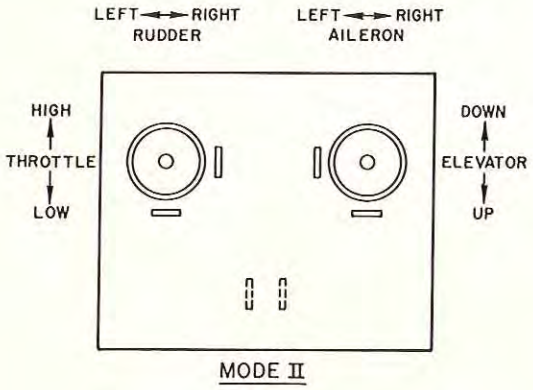
In flying R/C, "body English," which Curtis used, just won't work! As you enter the challenge of flying radio control, the first stumbling block will be the arrangement of the control sticks on your transmitter. Your answer will not be found here. We will however present the features of each control stick arrangement so that you can make your own choice intelligently.

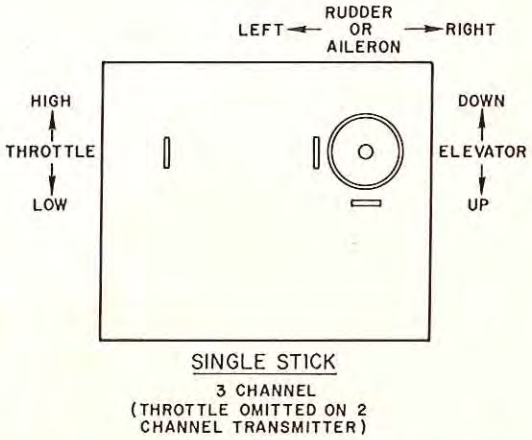
In the earlier R/C transmitters, known as the reed sets, there was uniformity in placing the control levers. Throttle control was always worked with your right thumb as was aileron control. Elevator and rudder controls were always worked with the left thumb. There was no other choice. If you flew a ship without ailerons, then the rudder linkage was worked by the aileron control lever. This is **still the way to do it!** Then, when you graduate to ailerons, your reflexes are already trained. Re-read this paragraph as it can eliminate a "wipe-out" on the first flight of your first aileron-equipped ship.

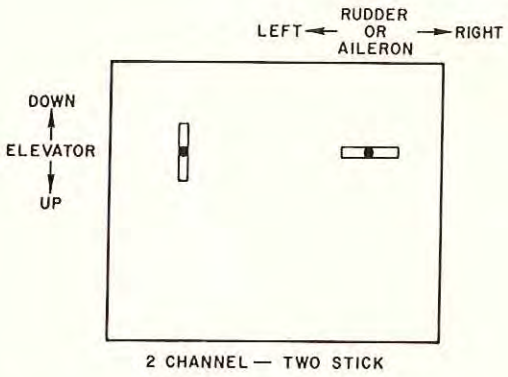
So, when proportional sets came out, the right stick controlled throttle and ailerons while the left stick con-











This series of drawings depicts the various transmitter stick configurations available on transmitters with various numbers of channels of control. Auxiliary channel and trim lever locations will vary from manufacturer to manufacturer and are depicted here as typical only.

trolled elevator and rudder – just like the reed transmitter with which most fliers were already familiar. This set-up is what is known today on the proportional systems as Mode 1.

But, with the possibility of control of two axis or two functions with a single control stick simultaneously from the transmitter, the purist, the newcomers, and the full-scale pilots turning to R/C flying, decided they'd set up elevator and aileron on the right stick and it would be just like flying a P-51. Roll left and pull back on the stick to make a left turn, etc. So they used the left stick for throttle and rudder, with ailerons and elevator on the right stick. This is what is known today as Mode 2.

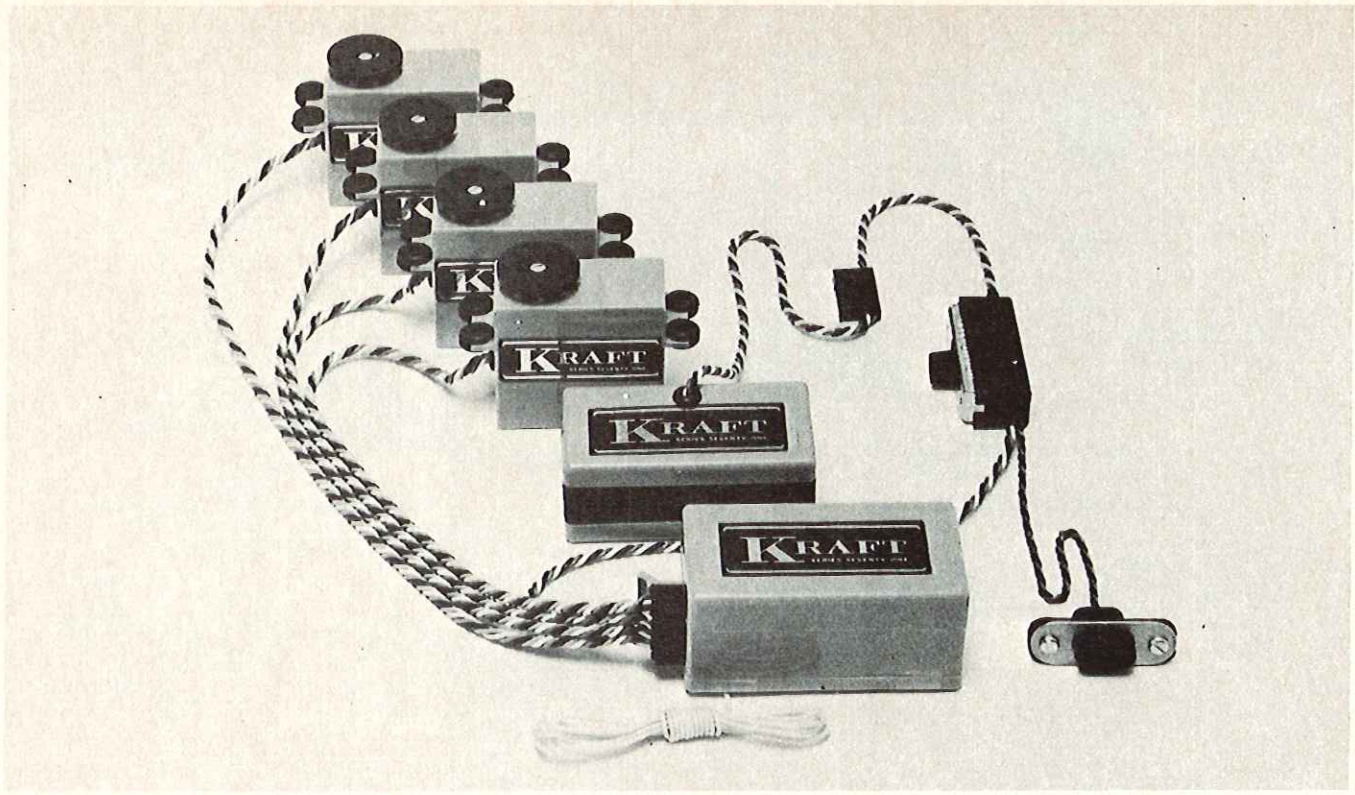
Then came the "super-purist" who decided to figure out how to twist the knob on the top of the right hand stick to control the rudder, put engine control on another lever and do away completely with the left hand stick. This is today's single stick mode. Each has separate distinct advantages and disadvantages.

For the former RC'er who is just coming back into radio control, and who once flew the early reed systems, the transition to a proportional set with Mode 1 sticks will be easiest. Also, this mode completely separates the roll and pitch axis controls with roll on the right stick and pitch (climb or dive) on the left stick so that no accidental cross control results. Many Mode 1 fliers say this is the most precise system for contest flying. However, you must take your thumbs off the sticks to change the trim settings. This can give unwanted maneuvering if you re-trim during your contest flight.

Single stick is for those who really want to imagine they're in the cockpit themselves. A great advantage here is that the right hand controls roll, pitch and yaw simultaneously, while the transmitter is cradled on the left forearm and the fingers of the left hand control throttle and the trim settings. Re-trimming your ship in flight is done easily and usually goes unnoticed by a contest judge. Because single stick is more complicated to manufacture this mode generally costs a few dollars more.

Mode 2 is for those who want the single stick feeling with the Mode 1 cost – a poor mans version of single stick flying. By sheer numbers of transmitters, Mode 2 seems to be the most popular in usage today.

The best advice possible is to attempt to fly an R/C model on each of the three modes and then judge for yourself before you buy. Most two stick sets are easily changed back or

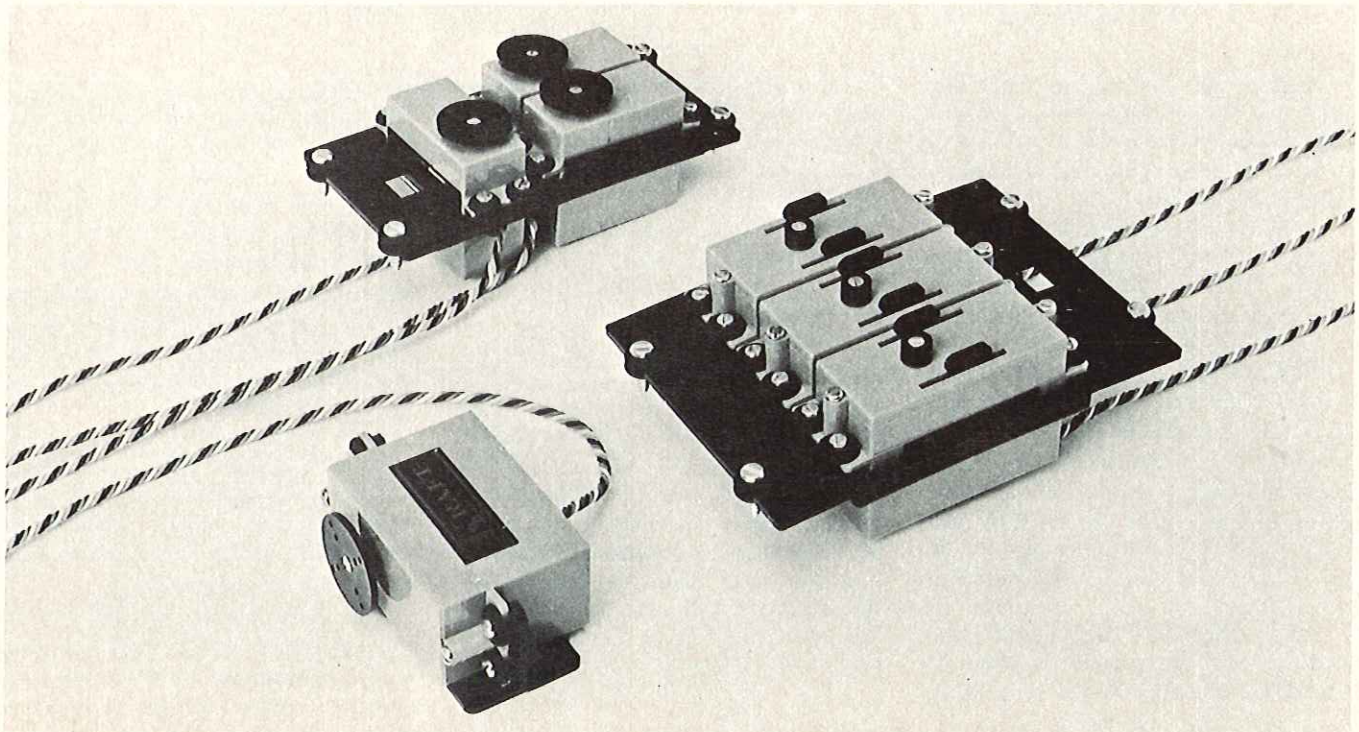


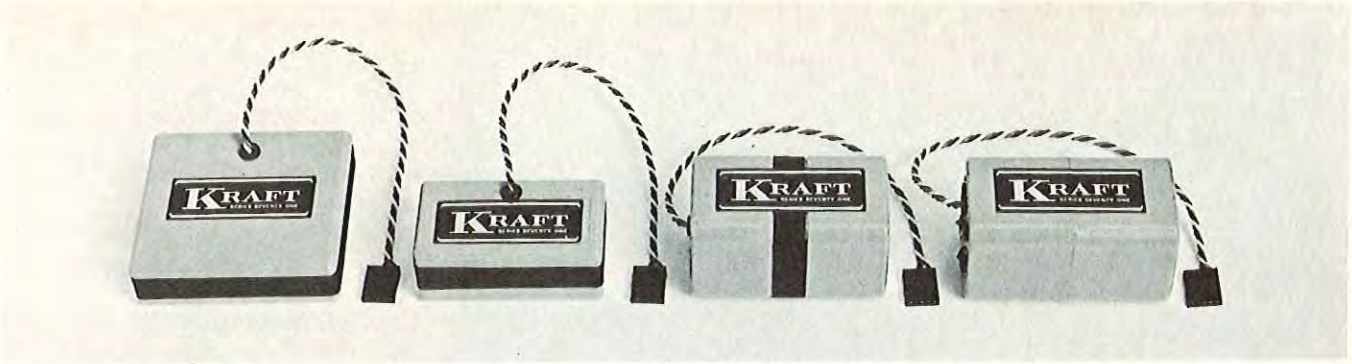
A typical four channel proportional system of the sub-miniature variety. In the foreground is the receiver. Behind it is a 225 mah rechargeable nickel cadmium battery pack, followed by four proportional servos. An on-off switch is connected between the receiver and battery pack. Plugged to right of receiver is charge receptacle for the battery charger. Total airborne weight is 9 ounces.

forth from Mode 1 to Mode 2 so it's no great problem if you wish to switch your thinking.

And now to the question of what do you buy if you're "left handed?" Forget about single stick, because you'll have an impossible time with the throttle and trims unless you can stand the extra cost of a manufacturer building a 'backwards' set for you - - - if, in fact, one will do it. Also, the resale value of an "odd-ball" set

Servos are available in different sizes and output configurations, varying from manufacturer to manufacturer. Output modes include rotary wheel or arm or opposed linear racks, or a combination of both modes on the same servo. Servo trays are always recommended for proper installation in your aircraft.





Battery packs are available in several configurations from most radio manufacturers. From left to right: A 500 mah flat pack; 225 mah pack; 500 mah square pack; and four pencell non-rechargeable pack commonly used with two-channel 'brick' systems. Not shown is a 500 mah round pack, also in common usage.

A battery charger for the rechargeable airborne and transmitter battery packs is standard equipment with most systems.

like this would be questionable. You're left, then, with a choice of stock Mode 1 or Mode 2 with the two stick functions **interchanged** so that roll and pitch are on the left stick and throttle and rudder are on the right stick.

SERVOS BATTERY PACKS AND ACCESSORIES

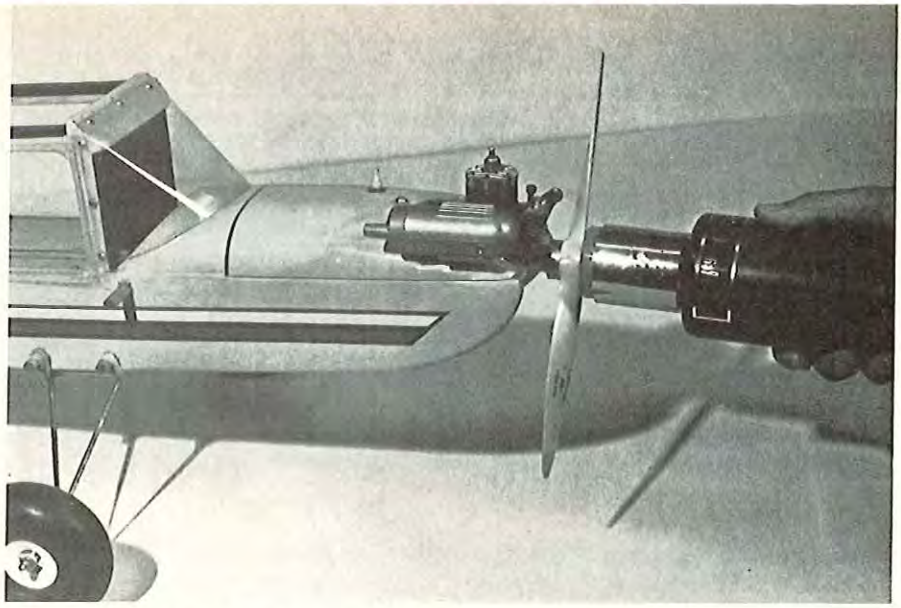
Also available as options from the major manufacturers are a choice of size and configuration of battery packs as well as an optional size and type of output of the servos. As an example, we are illustrating here the various battery pack configurations available from Kraft Systems as well as the size and output of servos available from that manufacturer. The larger servos offer a substantial amount of power while the various battery pack configurations, whether flat or square, are designed to fit in various types of ships. Insofar as the RCM Trainer is concerned, any of these servos offered by the manufacturers today as well as any of the battery pack configurations will fit into that design. However, you must eventually decide the type and size of aircraft you wish to fly. If you wish to fly the smaller aircraft, then the smaller servos and the square type battery packs are what you will need. In addition, the smallest aircraft often require the small 225 mah battery pack for lightweight installations. The range of weight can vary all the way from 8½ ounces for the smallest system all the way up to 16 or more ounces for the larger and heavier configurations.

The last item is one that is often contained with most of today's proportional systems, and that is a variety of servo mounting trays designed to use the installation in your aircraft. Although you will see at various fields the use of foam servo mounting tape, (this will be discussed in the equipment and installation chapter) this is definitely not recommended and in many cases will void the warranty of your system. The easiest and safest way to mount your system is on the mounting tray, or trays, recommended by the manufacturer. In most cases a variety of tray configurations are available such as for mounting three servos side by side, two servos side by side, with another mounted crosswise as well as aileron servo mounting brackets, etc. All of this will be taken up later in the equipment and installation section, but is something that should be considered in the purchase of your equipment.

Another innovation in the past two

To Page 83

Dual frequency switching is an optional accessory with some manufacturers. Photos illustrate method of changing frequencies.

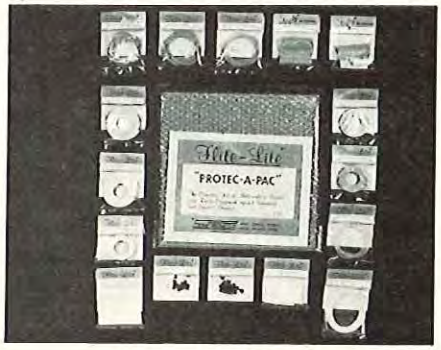


Sonic Tronics 'Challenger' starter shown with the spinnerless adapter insert. Pushbutton switch conveniently located for little finger or heel-of-hand operation.

RCM Product Report

SONIC-TRONICS NIFTY 'CHALLENGER' STARTER

BELOW, LEFT: The Nifty 'Challenger' . . . a powerhouse starter for any size engine. BELOW, RIGHT: The 'Flite-Lite' accessory line from Sonic Tronics . . . quality and convenience is the keynote.



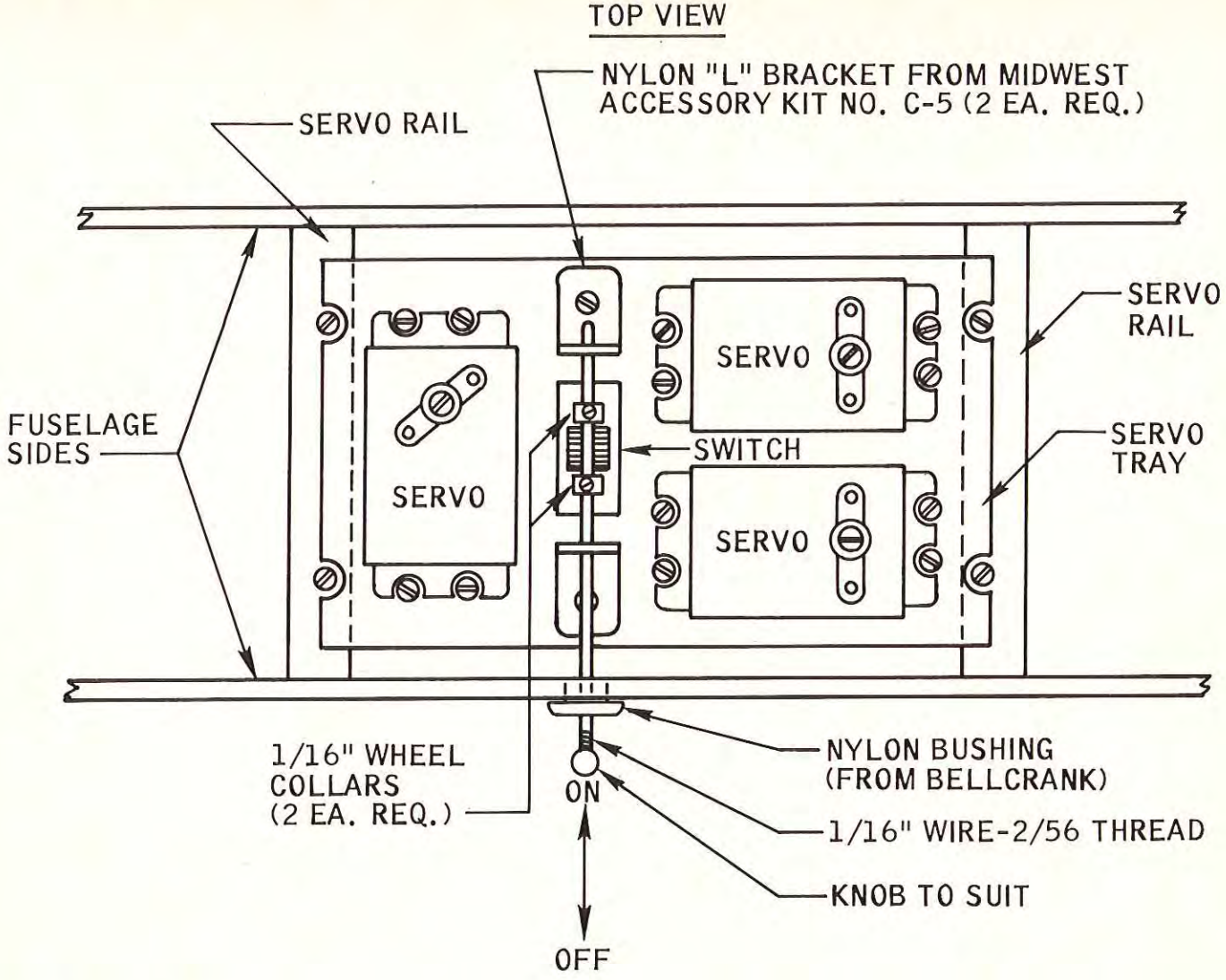
Sonic-Tronics Inc., 8017 Craig St., Philadelphia, Pennsylvania 19136, the world's largest manufacturer of model engine electric starters, introduced their new Nifty Challenger, and all new starter for 1972, and submitted a prototype to RCM for tests and evaluation.

The Challenger is a completely new 2½" diameter high torque model aircraft engine starter whose 12 volt motor is enclosed in a black vinyl jacket which seals the motor against oil and dirt that could otherwise get into the unit. The Challenger is a compact handfull of power with a tail switch located in such a position as to be operated with your little finger or the heel of your hand. The unit is direct drive with no gears to lubricate, wear, or need maintenance at any time. This is a versatile starter with a choice of adapters for spinner or spinnerless starting plus conversion to a race car starter by adding a simple converter. Our test unit was provided with a standard spinner drive and with the spinnerless drive insert for test purposes. We found the Challenger starter to have more than necessary power capable of cranking all available model engines including twins such as the Ross .60. The new Challenger also draws less current than the past Nifty Starter, produced in 1970 and 1971 by Sonic-Tronics, as well as others, which results in longer battery life and better cold weather operation. Equipped with a 6' power cord and colored clips, the starter unit is reversible by reversing the battery clips to the battery, which is important on counter-rotating twins. The unit has a high level of workmanship throughout and was obviously designed specifically for model engine starting usage and is not an adaptation from some other industrial application. The starter carries a two year guarantee in service to the customer and is quite evidently the fine result of many hours of engineering and design work. We found that the engine throttle can be set in any position for starting without damage to the starter resulting from over-run.

Priced at $35.95 retail, with race car adapters and spinnerless drive inserts available at $.98 each, R/C Modeler Magazine has found this unit to be one of the finest model aircraft engine starters ever produced. It is interesting to note that the Sonic-Tronics starter was selected as the official starter of the United States International team to Sweden in 1972 and was also used by many international contenders at the Doylestown meet of World Championship competition in 1971.

As indicated in the photographs, Sonic-Tronics also manufacturers additional engine and fuel accessories. In addition, the Sonic-Tronics Flite-Lite line of fuel tubing and foam tape includes quality surgical type tubing in small, large, and super size; and silicon tubing in most small and large sizes, both units of which are packed 2' per package. The foam tape line includes vinyl seating tape and vinyl mounting tape, available in various sizes at all hobby dealers.

The Flite-Lite Equipment Protection Kit includes one square foot of special foam material and patented air cell material which provides you with complete protection for your radio equipment against vibration and impact damage. For example, your receiver is first wrapped in a single layer of the Flite-Lite patented air cell material, followed by a single layer of the special foam included in the $.89 kit. All items have been Tested, Approved, and Recommended by R/C Modeler Magazine. □



P.W. HARDIN'S

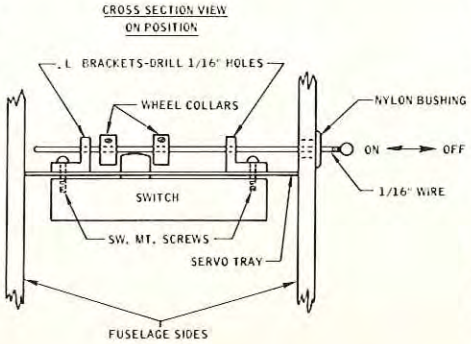
SWITCH INSTALLATION

Tired of broken switches, 'Mickey Mouse' installation? Here's one of the neatest and most trouble-free switch installations you'll ever use.

For a number of years I have been installing R/C switches inside the aircraft fuselage, operable from the outside by means of a wire and/or pushrod keepers connected to the switch by means of a hole drilled through the Bakelite pushbutton. Invariably the pushbutton tends to crack from vibration, excessive use, etc. Becoming tired of replacing switches, a new method of installation was investigated and this type of installation has been used on several models for over a year without one single switch replacement becoming necessary.

The switch is mounted horizontally inside the fuselage. Drill a 1/16" hole in two nylon L-brackets. Be sure that the holes are drilled so that the 1/16" rod does not rub on the switch pushslide button. The L-brackets are mounted with the normal switch mounting screws. After the installation of the L-brackets, line up the 1/16" holes with the side of the fuselage. Mark and drill the hole for your nylon bushing. (The bushing used was taken from a nylon bellcrank). Install the bushing and fabricate and install 1/16" control wire. Install two 1/16" wheel keepers as shown and adjust for proper clearance. The button installed on the control rod on the outside of the fuselage is left to the discretion of the modeler.

This is one of the neatest and most trouble free switch installations I have yet used and one which will provide you with excellent service. □



JEROBEE-COMANDO-EK LRB

From Page 33

the performance of the EK LRB proportional system. For less than $150.00 you can have a racing vehicle which can perform with the best of them and provide many hours of challenging racing excitement. Jerobee, does in fact, put you "in the drivers seat" with their new Comando configurations. The instruction manual provided with the Comando is complete with explicit instructions and detailed drawings so that even a youngster could operate this car successfully. We would have to rate this car as outstanding in all respects from design and engineering through its quality craftsmanship and truly phenomenal performance. The same is true of the EK Little Red Brick proportional system which maintains the quality for which EK Producs, Inc. has become internationally reknowned. □

RCM FUSELAGE JIG

From Page 35

them. Figure No. 4 shows the sides, formers and building jig. The slotted jig blocks are moved out a sufficient distance from the board centerline and the fuselage sides are placed against the jig blocks on their respective sides of the board centerline. The formers are put in place and the fuselage sides are placed against the former edges by moving the jig blocks in towards the centerline. The jig blocks are so adjusted that the fuselage sides and formers are symmetrical with the board centerline and the formers are parallel with the board crosslines. The fuselage sides and formers are now ready to be glued together. Figure No. 5 shows the fuselage placed in the jig. The jig blocks, on one side only, are loosened and moved away from the fuselage side so that the formers may be removed as shown in Figure No. 6. Your favorite glue is then applied to the former edges and the formers are inserted between the fuselage sides. The previously loosened jig blocks are then repositioned against the fuselage side and the formers aligned with the crosslines. By loosening the jig blocks on only one side, the fuselage will be back in the alignment determined prior to applying glue to the formers. The end result will be a fuselage that is straight with no twist. □

TAKE A LOOK AT THIS...

Big is the only way to describe the new kit from Texas Models Unlimited, 1623 Dumas Dr., Amarillo, Texas 79107. The Big Daddy 88 sports a wing span of 88" and a total wing area of 1408 sq. in. The all-up flying weight of this shoulder wing design is approximately 11 lbs. and is designed for engines from .60 up. The kit includes all hardware, wheels, engine mount, with kit parts sanded and machine cut. Complete easy to follow assembly instructions are included. An original design by Texas Models Unlimited, price is $89.50 for the Big Daddy, kit #RC-88.

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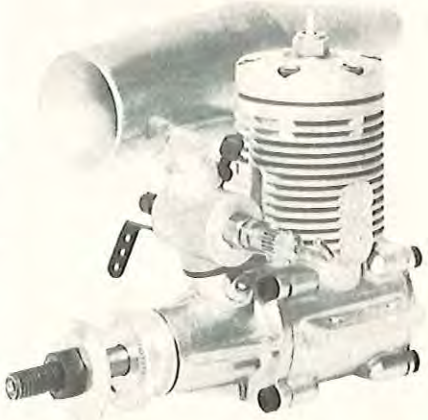
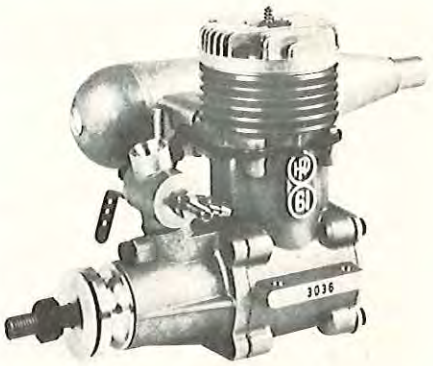
The new HP40FR (front rotor) and the HP61FR engines are now available from Nelson Model Products, 6929 West 59th Street, Chicago, Illinois 60638. These two engines are the only engines equipped with mufflers as standard equipment. Of special note is the fact that the HP61 engines were used by 25% of the entries at the 1971 World Championships at Doylestown, Pennsylvania. The HP61RR engines have been redesigned with all new internal parts and a completely new disc valve induction system. A marine version is also available. The HP40FR is quite a power house. It is capable of turning an 11-7 propeller equal to some of the .60 engines and it can be used to power any of the lighter weight .60 size aircraft. Their performance and dependability is such that it is well suited for competition performance in the pattern event. The HP40RR has created quite a controversy in the racing events. It seems that a stock out-of-the-box HP40RR is equalling the custom built tuned racing 40's now in use. Needless to say the HP40RR is going to be used by many of the racing experts next season. Many people have asked what is the difference between the 1971 and the 1972 HP61 engines. The following items are now utilized in the 1971 HP61FR engine: Sleeve now made from a casting; wrist pin held in with C-clips; connecting rod drop forged; cylinder head modified; piston modified; crankcase re-designed with different back plate cover; front housing manufactured differently; and the cylinder head is anodized blue. For further information contact Nelson Model Products in Chicago, Illinois.





A number of modelers have written in, following the review of the Murphy Muffler featured in a previous Engine Clinic Column by Clarence Lee, asking where they could be obtained. Although these are normally available through dealers, they can be ordered direct from Murphy Mufflers, Inc., 5312 E. Beverly Blvd., Los Angeles, California 90022. Three sizes of mufflers are available which will fit all engines currently in production. All that is necessary is an adapter at $1.95 each for your particular type of engine. A complete list of adapters is available from Murphy Mufflers. These mufflers have been Tested, Approved and Recommended by RCM.

A new product available from Pierce Hobby Supply, 6328 Parkview Way, Citrus Heights, California 95610,

is their Ridgid Rod, a silver type, high strength, low temperature soldering alloy. This has a temperature strength of 15,000 PSI at a temperature of 425 degrees F. The deposits are corrosion-resistant, bright and shiny, and do not turn black and have higher strength than conventional solders. Ridgid Rod is designed for use with a torch or soldering iron. Procedure for use is to clean the joint area and heat indirectly. When using an open flame method, do not play the flame directly on the Molten alloy or the flux. Remove the source of heat when there is sufficient temperature rise in the work to permit continuous deposition. Flux residues must be removed with water and brush. We have found Ridgid Rod to be excellent for joining stainless steel, piano wire, copper, brass, steel and silver. Package is priced at $1.00 each. Tested, Approved and Recommended by RCM.

An item that first struck us as somewhat unnecessary has turned out to be one of the most valuable additions to our field box. We are referring to the Davis Glow Plug Caddy. This is a unit designed to hold up to 12 glow plugs of various sizes and shapes, and designed to stop damaging elements or losing or fouling your unused glow plugs. No longer will you have to search the four corners of your messy tool box since these will keep your glow plugs securely in place until you are ready to use them. Priced at $1.49 and available from dealers or direct from Davis Model Products, Box 161, Glen Ellyn, Illinois 60137. Tested, Approved and Recommended by RCM.

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Silvertone Electronics, 727 Princes Highway, Tempe, N.S.W. 2044, Australia, has notified us that the name Silvertone, which has been used for some years in Australia, is in conflict with a trade name owned by Sears Roebuck. This is to notify RCM readers that the name Silvertone Electronics will soon be changed and the new name will be presented in this column as soon as it is known to us. In the meantime, Silvertone Electronics continues to manufacture a fine line of digital proportional systems available for domestic use in Australia as well as export to the United States.

*

Royal Products Corporation, 6190 E. Evans Ave., Denver, Colorado 80222, has added a new addition to their line of scale kits. Details on the Oscar Hayabusa, the forerunner to the Japanese Zero, are as follows: An all balsa kit with hand cut parts packaged by lettered section. The wing area is 632 sq. in. with a wing span of 59½". Fuselage length is 45" and the aircraft is designed for engines in the size ranges of .45 – .60. Priced at $59.95, this kit placed first in the 1971 Japanese Scale Championships held in August 1971.

Heath Company, Benton Harbor, Michigan 49022, announces their new "Flyweight" 5-channel R/C system with sub-miniature I.C. servos . . . priced at $224.95.

In the new Heathkit GD-19S Radio-Control system, Heath has managed to pack a lot of goodies into a mini-size package. The system features the new Heathkit Sub-Miniature Digital Proportional Servos, weighing in at 1.25 oz. each and measuring a mere 1-7/8" from mounting ear to mounting ear. Integrated circuits trim the fat, yet retain an amazing 3 lbs. thrust . . . identical to that provided by many larger servos. Servo features include 90 degree rotation in 0.6 second; 1% position accuracy; ceramic variable control feedback element; nylon gears and molded nylon case. The complete GD-19S system consists of four Sub-Miniature Servos; Heathkit Miniaturized Receiver with three ceramic IF filters for increased selectivity without alignment, double-tuned front end, RF amplifier and dual AGC for interference-free reception, high impact nylon case; Slim Line Transmitter with factory-assembled high output RF stage, Kraft sticks for precise control; built-in charging circuit that charges both transmitter and receiver batteries with one cord; 2 flat-pack nickel-cadmium batteries; choice of frequency desired. All components are easily assembled with the help of Heath check-by-step assembly manuals. The complete GD-19S system sells for $224.95 mail order. Separate GDA-19-42 Sub-Miniature Servos are available at $24.95 each. For additional information, write Heath Company, Benton Harbor, Michigan 49022.

Two new motor mounts for R/C model power boats are available from Octura Models, pioneer manufacturer of model marine supplies. The Octura 4-40 motor mount is for engines from .29 through .45 c.i. displacement. Designed to fit between engine bearers spaced 4" apart, the side mounting flanges are drilled to accommodate 8-32 screws. Engine mounting pads are undrilled but can be drilled and tapped to fit the four 8-32 socket head screws supplied with the mount.

For .15 to .29 engines, the Octura 3-30 motor mount is the answer. Of the same basic design as the 4-40 mount, it fits a 3" opening. Side flanges are drilled to fit 6-32 screws. Four 6-32 screws are supplied for fastening engine on mount.

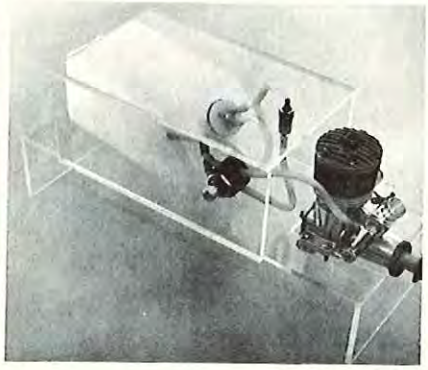
These mounts are not brittle die castings but are extruded from high

advantages. When the tank is filled the case will not flood, nor will it flood while the plane is standing, even on the hottest day, as long as the valve is in the fill position. (No more will you be embarrassed at a contest trying to start a previously fueled, but now flooded engine in the two or three minutes alloted at a contest.)

When using this system it is no longer necessary to disconnect the fuel line at the carb to fuel up, a method which increases the chances of dirt entering the tank, lines, and needle valve. If your ship is scale or tightly cowled, you will find the fill fitting a real boon. This consists of a threaded fitting for a one quarter inch hole, to be mounted about tank-top height. A Filter is included in this fitting which means no dirt enters any part of the system from the start.

Turning the Sonic Valve to center or neutral position will stop the engine.

The Sonic Clean Fuel System may be ordered direct from the manufacturer temporarily. The price for the entire system, less fuel tank, is $3.95, cash or money order. Distributor inquiries are invited by Sonic Tool Company, 9 Salem Drive West, Whippany, N.J. 07981.

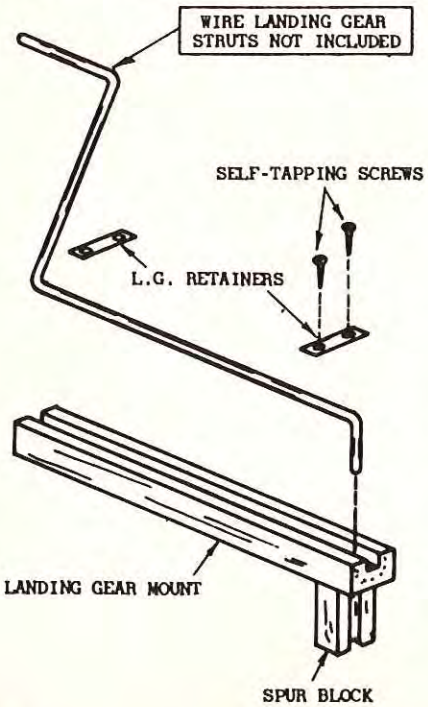


Just released by Sterling Models, Inc., of Philadelphia, Pennsylvania, is a complete assembly set for Maple Landing Gear Mounts.

Precision machined from premium quality grade Rock Maple, the set consists of a main horizontal beam, which has been slotted and drilled for the ready insertion of the wire landing gear strut (not included in the set); slotted Maple vertical spur blocks, into which the landing gear spur is inserted through the main Maple beam, as shown in the sketch above; and four steel landing gear retainers and eight self-tapping screws.

Landing Gear Mounts can be installed in foam or conventional wing, by providing notches to receive main

horizontal beam. Spur block is cemented in place, lining up slot with hole in beam, as shown. Wire Landing Gear installation consists of simply inserting spur through hole in beam, which extends through and is secured in slot in spur block. Horizontal portion of wire strut is pressed into beam slot and is secured there by the use of steel landing gear retainers and self-tapping screws as shown.



The design has been field tested and proved for many years and is highly recommended for any suitable aircraft. Part #116 Maple Landing Gear Mounts comes in a complete assembly set (not including wire Landing Gear) and is now available at all Hobby Shops for $.69 complete with detailed installation instructions. Tested, Approved and Recommended by RCM.

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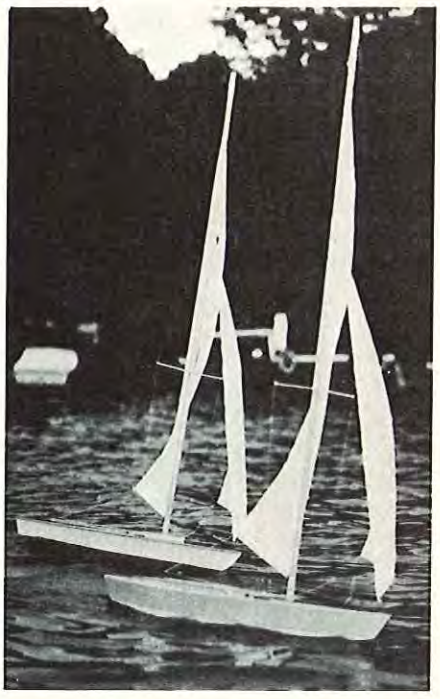
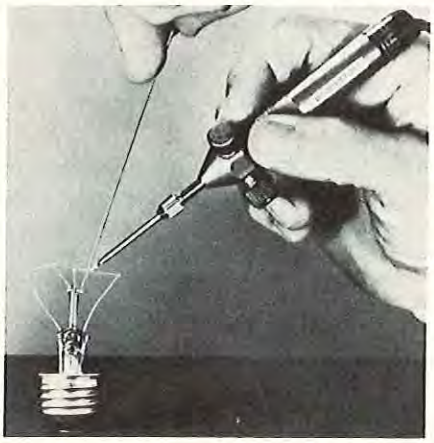
The Dumas 45" Star Sailboat, since its introduction about 4 years ago, has become quite popular as a radio controlled sailboat. There are several large radio controlled sailboats available and, with interest growing in racing these big model boats, the American Model Yachting Association has been formed and includes members all over the country. The Dumas 45" Star Sailboat has birch plywood frames, sides and bottom with mahogany deck. The 66" spruce mast is slotted for a bolt rope. The sails are ready-made with battan pockets. The boat is 45" long with a 12" beam and requires 9 lbs. of keel ballast. The ballast and radio are not included in the kit. Manufactured by Dumas Products, Inc., 790 S. Park Avenue, Tucson, Arizona 85719.



The Mini-Pro is an accurate miniature welding torch at a reasonable price from the Brookstone Co., Brookstone Building, Dept. T, Peterborough,

N.H. 03458. This is an industrial quality precision torch designed and manufactured by welding equipment professionals for the accurate micro-joining of all types of weldable materials. Its controllable pinpoint flame with up to 6300 degrees F temperature is completely stable down to 1/32" diameter and even smaller. This torch is ideal for wherever a precisely controlled miniature flame is required: for welding, soldering, or brazing of items too small for the flame of ordinary welding torches. It is perfect for applying a high degree of heat in an extremely localized area without damaging adjacent parts. Because of its unique simple design, the Mini-Pro sells for 40% below the cost of comparable torches. Its price is only $49.95 plus 75 cents for shipping, handling, and insurance. You get the same accuracy, versatility, and performance of higher priced torches at big savings and Mini-Pros quality is second to none. The Mini-Pro torch will operate effectively and economically on four types of fuel – oxy-acetylene, oxy-hydrogen, oxy-propane, and oxy-natural gas. It uses from .022 to 2.55 cubic feet per hour of gas and makes even the smallest tanks seem to last forever.



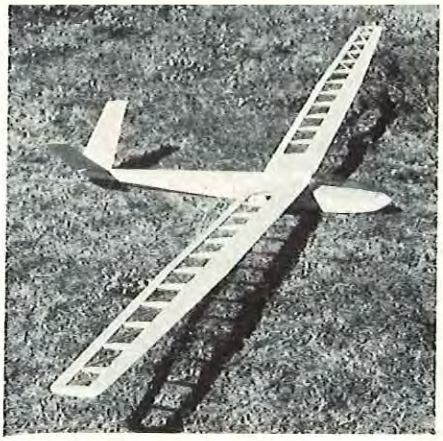
SPECIALIST 'V'

From Page 29

ing edge sheeting, the 1/4" sheet tip blocks, and the center wing fairing block. Cover the completed wing with Super MonoKote and iron in the 1/8" washout at each tip.

FUSELAGE:

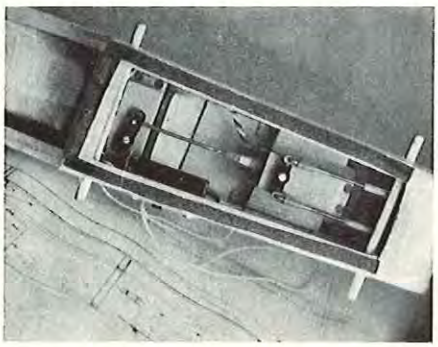
The fuselage is a simple box structure made of 3/16" square balsa covered with 1/16" sheet. The rear turtle decking is from soft balsa blocks sanded to sections (see plan). When complete, add the V-tail surfaces and small rear fairing blocks. Cut out the 3/32" plywood canopy formers to fit your model, glue together, and sand the fuselage smooth. Cover the completed fuselage with Super MonoKote and add the elevators and the wing dowels. You will note that some parts are not shown on the plan as they will be cut to fit your individual model.



Completed framework ready for covering.

Install your radio gear, servos, and add the Gold 'N Rod and control horns. Be sure to keep the correct Center of Gravity shown on the plan.

The elevator servo is fixed in position and the rudder servo slides in a plywood tray which is described in detail on the plans.



View of sliding servo tray arrangement.

The weight of the original model with Kraft radio and ballast rate was 36 oz. and works out to approximately 8 oz. per square foot wing loading.

My current Specialist V is now about one year old with many hours of flying time to its credit. I hope that you will obtain as much enjoyment with yours as I have with mine.

Good soaring. □

WAYFARER

From Page 25

and bottom trailing edge sheeting so that it fairs neatly together just beyond the extremity of the tapered trailing edge stock. When the top wing panels have dried, join them together using the plywood dihedral braces at the front and rear spars and at the leading and trailing edges. Remember that there is no dihedral in the top wing.

The bottom wing is identical to the top wing with the exception that it has ailerons, as well as 3/4" dihedral under each wing tip. Instead of a single 1/4"

rib in the center section, two standard LW-1 ribs of 3/32" sheet are used at the junction of the two lower wing panels. The aileron servo compartment can be any width you desire to fit your particular proportional servo. When the wing is assembled, the shaded area shown on ribs UW-1 are removed with an X-Acto knife and false ribs LW-2 are installed between the front and rear spars. The bottom of the servo compartment is floored with 1/8" Lite-Ply which is a new lightweight plywood available direct from Sig Mfg. Co., or from any Sig dealer. This material is used throughout the construction of the Wayfarer and saves considerably in the weight department. This particular type of plywood is extremely easy to cut and work, is less expensive than balsa, and far less expensive and lighter than conventional plywood while retaining a tremendous strength-to-weight ratio. The lower wing panels are built as one piece with the ailerons being cut out with a razor saw after construction is completed. Draw lines with a ball point pen or pencil on the top and bottom sheeting so that you know where to make your cuts with the razor saw. When construction is completed, the ailerons are simply sawn away from the wing and the leading edge of the ailerons capped with 1/16" balsa sheet while the exposed portion of the rear spar and the butt end of the ribs and the wing panel, itself, are also sheeted with 1/16" sheet balsa. A conventional nylon aileron bellcrank is epoxied between two false aileron ribs (LW-6) or, alternately, a 1/8" plywood plate can be epoxied into place inside the bottom sheeting of the aileron in the proper location and a conventional long control horn can be secured to the bottom surface with two sheet metal screws. The method of aileron horn attachment is up to you. Be sure that you have drilled the proper holes through ribs LW-4 and LW-5 to allow passage of your 1/16" wire aileron pushrod to the Goldberg aileron bellcranks. The latter are mounted on aileron platforms cut from 1/8" Lite-Ply and cemented into the two LW-5 ribs.

After joining the wing panels together, cut the wing tips from 2" x 1¼" x 8" soft balsa block and

sand to shape. Glue the tip blocks in place and sand both completed wings using progressively finer sandpaper until the wings are perfectly smooth. Finally, hinge the ailerons in place on the lower wing.

Fuselage: Begin by cutting the fuselage sides from 3/32" sheet balsa and cement the 1/32" plywood doublers in place with Wilhold contact cement. While these are drying, cut the two cabane struts from 1/4" plywood and sand to a pleasing contour. Next, cement the 1/4" spruce longerons and the cabane struts into place using epoxy glue. Cement the 3/16" square balsa longerons in the aft portion of the fuselage sides. Next, cut the firewall (F-1) from 3/16" or 1/4" plywood and formers F-2 through F-6 from 1/8" Lite-Ply. Sand to shape and glue formers F-1, F-2, F-4 in place with epoxy using a triangle to make sure that they are at right angles to the fuselage sides. Before joining the other fuselage side to the formers cut and contact cement in place the 1/8" Lite-Ply wing saddle triplers, the 3/16" square balsa tank floor supports and the 3/8" triangular balsa in the bottom of the battery compartment and from former F-2 to the lower wing saddle opening. Before installing the triangular stock in the landing gear area, cut the landing gear support plate from 1/8" plywood and install between the fuselage sides. Recess the 3/8" triangular balsa to fit over the plywood landing gear support plate and glue in place. Be sure that you have glued the 3/16" square balsa uprights and the 3/32" vertical grain balsa doubler in place in the tail section. The doubler fits between the 3/16" square balsa longerons, former F-6, and the 3/16" sheet upright at the tail post area.

Now, join the second fuselage side to formers F-1, F-2, and F-4, making sure that the second side is exactly parallel to the first. When epoxying the firewall F-1 in place, we use Sears Filled Epoxy cement for maximum strength. Although this is a slow drying epoxy, it is virtually the strongest such adhesive we have ever found.

When the two sides and the formers have thoroughly dried, block the fuselage in an upright position over the top view shown on the plans and pull the tail post together, securing with epoxy. Add the 3/16" square cross braces and formers F-3, F-5, and F-6.

Next, add the 1/4" spruce stringer in the front and the rear at the top of the bulkheads. Do not substitute balsa for the spruce since the pressure of the sheeting, when applied, will cause a bowing in the turtledeck.

At this time, install the 1/8" Lite-Ply tank floor and your Pylon Brand RST-8 tank. Since there is no fuel compartment hatch, this tank is mounted permanently in place and must be tested for any leaks prior to installation. Make sure that the tank is completely surrounded with foam rubber or G-Pad to keep it from moving. We recommend the use of the new Sullivan Foam inside the Pylon Brand tank to prevent any foaming due to vibration. Drill the proper holes in the firewall for the passage of the brass pick-up tubes and then brace the tank so that it cannot slip backwards against bulkhead F-2. When this has been completed, sheet the fore and aft top sections of the fuselage with soft 3/32" sheet. The easiest method is to cut your sheeting to exact size to go from the fuselage top to the center of the top stringer using two pieces, one for each side of the fuselage in the front and in the rear. The front sheeting extends from former F-1 to the center of former F-4. The rear sheeting extends from the corner of former F-4 to the end of former F-6. Be sure to wet the sheeting thoroughly on the outside to allow the proper curvature. Sheet one side of the fuselage at a time, using masking tape to hold it in place until the glue has dried and until all moisture has evaporated from the sheeting. Then, proceed with the other side, making sure that you have a neat joint line in the center of the spruce stringers. When your sheeting is thoroughly dried, cut out the cockpit area and sheet the floor with 1/8" Lite-Ply. At this time it would be advisable to cut the switch and charging jack holes in former F-3. Next, add the 3/4" sheet balsa cowl pieces and epoxy in place to the firewall. Finally, add the 3/4" x 4" x 8" balsa nose block and the 1/2" hard balsa filler block between the cheek pieces. (We hope, that before you sealed up the top of the fuselage you installed the blind mounting nuts for your Kraft-Hayes Motor Mount!) The belly block is cut away at the point where the landing gear is installed and the Hallco B-105-5 aluminum landing gear is bolted in

place with short 6-32 nuts and bolts. The remaining piece of belly block is sanded to final shape and installed over the Hallco gear as a smooth fairing piece. Finally, sheet the bottom rear of the fuselage with 3/32" sheet balsa applied cross-grain. Install the wing dowels but do not install the 1/8" Lite-Ply cabane strut cross braces until the airplane is completed in order to facilitate reaching otherwise inaccessible areas of the fuselage around the cockpit. Before going on to the tail surfaces, cut yourself a plywood shim to fit behind your Kraft-Hayes or Tatone motor mount to provide 2 degrees of downthrust and 3 degrees of right thrust.

Tail Surfaces: The stabilizer is built on a flat board and consists of a structure of 1/4" x 1/2" balsa strips, 1/4" sheet balsa center section, 1/4" x 1/4" cross pieces, and 1/8" x 1/4" diagonals. This is an open structure and is completely strong and rigid when completed. Be sure to double glue all butt joints of the balsa wood pieces to assure permanence of your glue joints. The elevators are cut from 1/4" balsa sheet and can be joined with a 1/8" wire joiner or a 1/4" spruce dowel. The vertical fin and rudder are also cut from 1/4" sheet balsa and sanded to a smooth airfoil section. When the stabilizer has completely dried, glue the 1/4" sheet balsa vertical fin in place, checking it with a triangle to insure proper alignment. Sand the entire tail assembly to final shape and install the stabilizer and vertical fin in position on the fuselage, checking at all times for proper alignment. Form the tail wheel strut from 3/32" and 1/16" music wire, wire together and solder, and install in the vertical fin. The fuselage fairing blocks can now be cut to shape, rounded, and installed in position on the stabilizer and against the 1/4" sheet balsa vertical fin. Add the small 1/4" fairing piece to fill the gap between the vertical fin and the space between the two fairing blocks.

Finishing: Sand the entire airplane using progressively finer sandpaper until you are pleased with the final results. For any fillets, such as at the juncture between the rear fairing blocks and the vertical fin and stabilizer, we use micro-balloons and epoxy glue, or corn starch and epoxy. This can be smoothed on with the finger, wetted slightly, and faired out nicely with almost no sanding required. The prototype in the photographs used yellow silk on the wings with clear

dope applied to fill the grain structure of the silk. Finally, the wings were allowed to cure for seventy-two hours and two coats of clear Hobbypoxy were applied overall for an excellent gloss. Either MonoKote or Solarfilm could be used on either wing with an overall reduction in weight. The fuselage and vertical tail surfaces were not silked at all but used a filler followed by white Hobbypoxy color, sprayed on. If you prefer, use Francis Surfacing Resin followed by K & B Super Poxy. We would not recommend the use of silk on the fuselage since it is more than adequate in the strength department and the additional weight would only detract from the performance of the aircraft. We would also not recommend the use of one of the plastic covering materials since getting in and around the cabane struts is quite a job. If you feel up to tackling it, be our guest!

The cockpit coaming is made from black fuel tubing which has been split lengthwise and cemented in place with Walthers Goo. The headrest is simply a piece of soft balsa block which has been carved and sanded to shape and cemented in place. Paint the cockpit floor a dull black or simply stick a piece of dull black Contact shelf paper in place. Mount a pilot's head of your choice using a sheet metal screw from underneath and drilling a hole in the bottom of the William Bros. pilot and pouring epoxy into the hole. Put the pilot in place over the screw and the epoxy will hold it permanently in place. Since this is a fairly large biplane, several dolls heads available at local toy and department stores will also fit in the cockpit area. The switch and charging jack are easily accessible by mounting them on the instrument panel (former F-3). If you prefer, a piece of wood grained Contact shelf paper can be cemented in place and IM scale instruments available from local hobby shops, or from Hobby Lobby International in Nashville, Tennessee, can be used to dress up the cockpit area.

Finally, hinge all control surfaces using your favorite hinge. We used Du-Bro hinges throughout. 3½" Du-Bro regular wheels were used for the main gear and a 1¼" Veco wheel was used for the tail wheel. An O.S. .40 front rotor engine with muffler was used and provided more than adequate power swinging an 11-6 prop. Anything from a .40 to a .60 engine can be used while the .40 provides more scale-like speeds for this vintage-type biplane. A powerful .60 will pull this airplane straight up and out of sight almost faster than you can blink your eye! With regards to the installation of radio equipment, the space available to you is immense and any of the older and larger systems will fit, not to mention the newer micro miniature radios. This airplane may be flown in the conventional manner or, as mentioned, can use coupled ailerons and rudder. Finally, when all finishing has been completed, glue the cabane strut cross braces permanently in place.

FLYING

I couldn't begin to describe to you the flying characteristics of the Wayfarer, since it is one of the most interesting and unusual aircraft that you will ever fly. I can only say that it flies more like a full scale biplane than it does a model. This is not an airplane that you bang around with full deflections of the ailerons since it requires the use of rudder in the turns for smooth coordinated turns. As the Wayfarer climbs out or makes a slow fly by, it is, in my opinion, as close to flying the "real thing" as you can

obtain with a model. It requires virtually no correction on takeoff and tracks straight and true with no ground looping tendencies. The climb out is straight and, if you don't feel a certain thrill watching the old biplane flying into the sunset, then you'd better go back to that low wing, jet-like over powered monster that can be found at any flying field. Make sure that the center of gravity on your Wayfarer is no further aft than that shown on the plans. It can be up to 1/2" forward of that point, but not rearward.

Good luck with your Wayfarer and I hope you'll send me a picture of it c/o R/C Modeler Magazine. This has been one of the most enjoyable aircraft that we have flown and we think that you'll like your version equally as much.

Good Flying. □

FLIGHT TRAINING COURSE

From Page 61

years is the "buddy box" type of R/C flight training. This is one that is highly recommended by RCM for use in learning to fly. What is involved is a training system which gives the beginner a chance to learn without the usual discouragement and expensive crashes. For training purposes, two transmitters of the same manufacturer are connected together with a cable which is plugged into the same receptacle used for battery charging. Transmitters need not be on the same frequency, may be four or six channels, and the system is interchangeable between Mode 2 and single stick. The instructor retains control until he pushes the button transferring control to the student's "slave" transmitter. As long as the instructor holds down the transfer control button, the student has full control. If the student gets into trouble, the instructor releases the button and assumes control, preventing an accident. This system is definitely recommended and, while you may not wish to incurr the additional expense of a training transmitter in order to learn to fly, many clubs now have such a system for use with their newer members who are just learning to fly. It would be wise to investigate if your local club has such a system before purchasing your digital proportional system. □

ENGINE CLINIC

From Page 10

which I feel are a decided advantage. A lot of your loss of power, when installing a muffler, is due to heat being transferred from the muffler back to the engine. Cooling the muffler will, in turn, let the engine run cooler. To my knowledge the only other muffler using cooling fins has been the Super Tigre. One final feature is an exhaust pressure outlet fitting. Some of the competition fliers have been using exhaust pressure to pressurize their fuel tanks for more reliable engine runs with some degree of success. The Kavan muffler has a pressure tap for this purpose.

Price of the muffler is $9.95 plus an additional $1.95 for the adapter for your particular make of engine.

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Dear Clarence,

A few of my friends are quoting you as saying that a K & B .40 delivers a half pound of untimed crankcase pressure. Some of us feel that this figure may be a little low. Some time ago there was an article in one of the magazines dealing with some tests run on the E.D. Power Pipe. The engine used was a K & B .35 Torpedo, the one with the ball bearing front end. At that time there was some discussion as to the different effects of timed and untimed pressure when

a pipe is being used. If my recollection is correct, it was stated that pressure taken from a timed fitting was measured at about six pounds and untimed pressure was two and a half pounds. This was a front rotor engine so the crankcase volume was probably as much or more than a rear rotor forty.

Is there enough difference in the two engines to cause that much difference in untimed pressure readings? Would the volume of the tank make a difference? Is there more than one way of obtaining these readings and could different methods of experimentation cause seemingly conflicting reports?

One more question: How much can I lighten a K & B .40 piston? One individual says he removes a gram. I've never weighed what I've removed but I don't think it would be that much. I haven't noticed any difference in rpm on the bench but I feel there is a slight increase in the air. I'm beginning to wonder if this is a safe procedure and if it's worth the effort.

Best wishes,
Dan Gilroy
Alberta, Canada

Dan, there are many variables that will effect the amount of untimed pressure an engine will put out. First of all, untimed pressure is going to depend upon the differential between the amount of time the intake is open and closed. The closed, or bypass period, being the time when the pumping action occurs. A racing engine such as the K & B .40 rear rotor will have a longer intake period, being open as long as 210° of crankshaft rotation. This, then, only leaves 150° of crankshaft rotation for the bypass period. Your more conservatively timed front rotor engines and stunt engines will have a shorter intake period of 180° to 190°, leaving a longer bypass period of 170° to 180°. This longer bypass period is also a longer pumping period and results in higher pressure. You must also take into consideration the type of engine. A lapped piston engine will have a better seal and higher base pressure than an aluminum piston ringed engine that must be fit more loosely to allow for heat expansion. The volume of the crankcase also plays a part as you mention, plus any leakage out the exhaust, front bearing, etc. A half pound may have been a little conservative but it is a good average figure. Few engines will exceed one pound and I have serious doubts that anyone ever obtained two and half pound of untimed pressure unless it had something to do with pressure induced by the 'pipe'.

As for lightening the piston in your .40 – don't do it! The amount of weight you can remove is not enough to matter. The engine will be a little smoother but you will not pick up enough rpm to matter and you will increase the chances of the piston going out of round.

Dear Mr. Lee:

I have a new Andrews A-Ray on the board and was wondering about the new K & B Torpedo .40 RC Series 70F with the Perry Carburetor for power for the A-Ray. Being a beginner, I am learning on a Falcon 56 with a Super Tigre .23 and am building

the A-Ray for the next step. I want an engine with ample power for the A-Ray, one that is easy to start and break in, and has a reasonable idle, but most important, I want an engine that I can get parts for easily and quickly. I have already experienced the parts problem with the Super Tigre as I cooked the cylinder and piston trying to break it in on the bench, and these parts are not available.

I am not interested in a hot contest type engine at this point, I just want reliable power for sport flying. I missed the article in your column about breaking in these little engines and would appreciate any suggestions you might have on breaking in the Super Tigre when I get it fixed. I am using Fox Superfuel as per your recommendations.

One other question: What are your recommendations concerning setting the exhaust baffle in relation to the throttle opening on the Super Tigre .23 and the position of the hole in the spray bar in relation to the venturi? I ask these questions because my carburetor came in pieces with no assembly instructions.

One suggestion for your column. You might run a list of the available engines and what they are suited for (i.e. Sport Flying, Pylon Racing, Performance Pattern Flying, etc.) I know I would appreciate this type of information.

Sincerely,
Charles Weiser
Kokomo, Indiana

Taking your questions in order, Charles – the K & B front rotor .40 would be a good engine for your A-Ray. If you have more power than you can handle you can always throttle back. As for breaking in your Super Tigre, or any other engine for that matter, this was discussed in the very first 'Engine Clinic' column. A reprint is now available in 'The R/C Engine' from the RCM Anthology Library series of books. I recommend you purchase a copy for, as a beginner, you will find much useful information. The hole in your spray bar should always be straight down in relation to the venturi. With the carburetor barrel cracked open just a hair, the exhaust baffle should just have closed. We'll see what we can do about a list of available engines and their intended use in a future column.

Dear Mr. Lee,

Do you happen to know of anyone that manufacturers replacement parts for some of the old time ignition engines? I have several engines from the 1946 to 1948 era that I would like to put in operation if I could only find the parts.

Yours very truly,
Donnald Stoddard
St. Louis, Mo.

Nobody, to my knowledge, manufacturers replacement parts for the old time engines. Tim Dannels, who publishes the 'Engine Collectors Journal', runs a parts wanted and parts available section in the Journal each issue. For any of you fellows interested in old time engines, I would suggest that you subscribe to the Engine Collectors Journal. You can often pick up needed parts by following the parts available section. For 50 cents you can take an ad and list those that you may need. The address is P.O. Box 15162, Lakewood, Colorado 80215.

Dear Mr. Lee:

I have an O.S. Max-S .35 R/C with the Max muffler without the restrictor rings. This is the bushing, not the ball-bearing model. The engine has very good idle and transition on 10-6 or 10-5, but it just does not have much power at the top. It has about two hours of air time. Others with the 35-S or 30-S have similar complaints. My S.T. 23 is very much stronger. Is there anything that I can do?

Also, I have a new, and un-run, Enya .60III T.V. When I removed the front cover to check for flash, binding and such before first running it, I noticed that the machining process had left quite a sharp edge where the by-pass enters the lower portion of the crank case. It would seem that this would hinder gas flow quite significantly and that it could be ground away to advantage. What do you think?

Very truly yours,
Bruce Campbell Buck
New York

Both the O.S. Max S.30 and .35 are ported for reliability rather than all-out power and are not particularly noted for their screaming output.

However, if your S.T. .23 is much stronger than your O.S. .35 there is something obviously wrong with the engine and you had best send it to World Engines for servicing. Removing the sharp edges where the bypass joins the lower case is okay but there would be no advantage to grinding the edge completely smooth at the rpm range we operate stunt engines. The bypass area, along with the skirt ports in the piston and sleeve, provide adequate transfer area. Years ago the old Dooling .61 did all of its bypassing through holes in the piston and sleeve with no direct bypass opening to the lower case at all. It was the highest revving engine of its day.

Dear Mr. Lee,

A few months ago I purchased a Fox .78 RC engine new with the standard Fox carburetor. Since then, I have broken in the engine properly and installed it in a 7 ft. Piper Cub. The engine runs well at high speed swinging a 14-6 prop, but does not idle very well, or have a smooth transition from intermediate speed to high speed. I have readjusted the carburetor time and again and it does not help. Is this a poor design carburetor or what? Could I possibly change and use a large Kavan or Perry instead?

I have the tools and ability to make a flange adapter to fit one of these to the engine. If you think this will help, what size or model number carburetor should I use? As near as I can figure the venturi has a bore of .404. I am using a K.O. muffler and burning K.B. 500 fuel.

Sincerely yours,
Michael O. Szemety
Elyria, Ohio

Mike, I receive quite a few letters every month wanting to know how to adjust the Fox carburetor. This is actually somewhat of a puzzle to me as Duke includes an instruction sheet with every engine explaining how to adjust the carburetor. I guess it is just a matter of who bothers to read instructions.

There is nothing wrong with the design of the Fox carburetor, in fact it is probably one of the best designed carburetors available on a model engine. Its only shortcoming is its complexity which seems to be beyond the ability of the average R/C modeler to adjust. The Fox carburetor is very similar in operation to your automobile carburetor in that it has high speed, intermediate speed, and low speed jets. I think one of the problems has been that few fliers seem to be aware that the carburetor does have an intermediate range adjustment. On earlier Fox carburetors this was the fuel line fitting itself, which could be screwed in or out to regulate the intermediate range. The later carburetors work in the same way but do have a larger diameter knurled wheel for adjustment. To adjust the Fox carburetor, start the motor and adjust the high speed in the regular manner. Then throttle down to idle. Screw the idle mixture adjustment in (lean) until the engine starts to falter. Back it out (rich) until it again starts to run rough. Then set the needle in-between these two settings. If the engine is idling too slow raise the idle speed slightly or, if too fast, lower slightly with the idle speed screw. You want the engine to idle at approximately 2500 rpm. Open the throttle to the half speed position and adjust the intermediate range. Turning the disc in leans the mixture and turning it out richens it. This will adjust more like the high speed adjustment so turn it in until the engine starts to sag a little on the lean side and then back it out slightly. Open the throttle and readjust the high speed. Now throttle back to idle again and let the engine idle for a short period, then open it quickly and see if it accelerates cleanly. If it sags slightly and hesitates, it is too lean, so richen the idle mixture a hair. If it sputters, pours out

a lot of smoke and is slow to accelerate, it is too rich so lean the idle mixture slightly. Many fellows try to compensate for bad acceleration by adjusting the intermediate range. This is wrong as it is the idle that is causing the loading-up or leaness. This all sounds pretty complicated but, once you have the carburetor set properly, it will need no further adjustment other than touching up the top end for the day. One other point – due to the number of gas passages in the carburetor it is of most importance that your fuel be clean and the use of a filter in the fuel line is recommended.

As to changing the carburetor, if you do wish to go this route the Kavan would be the better choice. Regulation in the Perry would not allow enough fuel to pass for a 78. All of the Kavan carburetors for the .60 size engines have the same size venturi. Only the neck diameter for the various makes of engines differs. Any Kavan carburetor for a .60 engine will work well on your engine. □

LETTERS

From Page 5

this service offered by Eastern.

Sincerely Yours,
James M. Hoffman
Hollywood, Florida

ROSES . . .

Sir:

You have a gentleman advertising in your magazine by the name of Roger Meyer, who assembles and repairs Heathkits and Royal Classic equipment. I find it very hard to tell you of the very fine work and service that this gentleman gives. He continually goes out of his way not only to build and repair the equipment so fine that I do not know how he stays in business, but he also keeps in touch personally with each of us to see how we are doing and he never fails to answer any and all questions pertaining to our equipment, no matter what it may be. I have never had the chance to meet him in person, but I hope to soon.

I can only say for myself and fellow modelers here in Puerto Rico, that if many of your other advertisers were half as good and courteous as is Roger Meyer, this would really be some hobby.

Thanking you in advance, or I should say once again, for having such a fine staff and magazine. I remain a very happy and contented subscriber.

Kindest Regards to All,
Harold T. Newby
Vista Bella, Bayamon, P.R.

. . . . AND BRICK BATS

Sir:

Just wanted to let you know that response to your "Reader Service" is pathetic! I sent the list of manufacturers to your office in September, and, to this date, of 33 companies I checked off, 21 have yet to send me any literature. Even more confusing to one is the fact that a friend wrote to you in the past two weeks and he has received literature from a few of the 21 companies which haven't sent me anything yet! I realize you do not control their mailing list or response, but I felt you should know what hasn't been happening with these people!

I am no 12 year old with a yen for free-flite rubber or strictly "U" control (though you or the manufacturers have no way of knowing this), but a builder and flyer of powered models

since '35 who had an interest in RC way back (but not the long green!) and now I am in a position to make this a reality. O.K., just wanted you to know that something is definitely lacking with the model people when they're not even interested in letting people know exactly what is available in merchandise to the serious hobbyist and modeler and you should pass this sqawk on to them.

I'm still going into RC, in spite of the negative response on the part of these people, but rest assured I will be influenced by the lack of simple courtesy involved when I invest in equipment, just as much as by an obnoxious TV commercial.

Thanking you, I remain

Sincerely Yours,
Domanic Abato
Plainview, N.Y.

MORE ON NOISE

Sir:

In leafing through the October 1971 issue of Outdoor Life I came across an article "Are You Shooting Your Hearing" by Dr. David N.F. Fairbanks. Being in the military I was aware of the injury to hearing which can be caused by gun fire and in fact probably have some loss in the upper ranges due to that very cause.

What I am wondering is, has anybody given any thought or consideration to the effects of our high-speed model motors, without or with mufflers, on hearing. An article might prove very interesting and I believe that Doctor Fairbanks article might be a good starting point.

As a matter of fact, I have taken to wearing the valve type ear protection device when I am around model motors. However, after reading Doctor Fairbanks article, I think I will start wearing the muff type protective device. I know one can appear sort of ridiculous wearing them around model airplanes but then again I do like to be able to hear the telephone from the next room.

Your truly,
LTC Joseph A. Dudzik, Jr.
Arlington, Virginia

SUNDAY FLIER

From Page 8

certainly eliminates any element of inconsistency. They tape recorded the

starting countdown. After the planes have been identified and assigned a flag at the far pylon, the tape recorder is started.

"The time is one minute from start," it intones.

"Forty-five seconds from start – now," it reports fifteen seconds later. Then, "thirty seconds from start – now."

"Fifteen seconds from start – ." Five seconds later, the recorded countdown begins, "ten-nine-eight-seven - six - five - four - three - two-one - START!

With this tape recording, time is consistent, and the skill of the pilot comes in judging his starting position so that he'll be coming up on the starting line – but behind it – at full speed when the command is given to start. I recommend this system to any club that plans to have a slope racing event.

I was particularly pleased to see Ron Neal, designer and manufacturer of the Gryphon flying wing, come up from Los Angeles and go back with the first place trophy. He modified one of his Gryphons by cutting off the tips square and adding tip plates – which he believes helps to increase the speed. Maybe so – but as I saw it, the real reason Ron won was because he's really got the racing touch since the last time, and he flew five perfect races! And, of course, nothing can touch the Gryphon when it comes to making those pylon turns. Although I wish he and I hadn't been on the same frequency. My modified Top Sailer, with upswept wing tips replacing the ailerons, which fluttered, makes pretty tight turns also. Maybe next time. Love that slope racing!

★★★★

This past month has been a particularly busy and interesting period of modeling for me. Maybe it's because I took a little vacation from thermal soaring – which can use up a lot of your weekend if the lift is good and half hour to one hour flights are the order of the day. Anyway, I've been watching the growing interest in scale, and semi-scale, R/C which results directly from the confidence the modelers have in their equipment; they're no longer worried that radio failure will wipe out months – even years of work in making the perfect scale job.

Two models in particular caught my eye, and I went out to watch them on their test flights.

First, take a look at that little

biplane built by Monty Groves (whose famous Winnie Mae model now resides in the Smithsonian). Monty and his wife, Pat, probably have more historical lore of the Lockheed Aircraft Corporation's early days than the company does itself.

The biplane is an exact scale model of the Loughead S-4. There was only one built, but Monty not only has all the specifications – he even has the original engine which was used to power the full scale airplane.

Were it not for the propeller, it would be virtually impossible for even the most expert observer to tell this model from the original. The rigging, landing gear fittings, cowling – everything is there. And get this – including the mechanism to fold up the trailing edge of the center section and then fold the wings back alongside the fuselage! And for the final, unbelievable touch, just as in the full scale airplane, the entire surfaces of the two lower wings serve as aileron control! I have to tell you, this is one of the most unbelievable models I've ever seen! And, although I've never flown it (nor do I think I'd want to, just on the chance I might nick it), I am told by Jim Sunday, who made the test flights, that it flies as good as it looks. And, that's perfect!

•

The other scale model which really intrigued me was Don Jacobus' SR-9C. This six foot, five-and-one-half pound model, with an O.S. Max .40 up front, is as easy to fly as any sport model – once you get over being nervous about its beautiful scale appearance. I was particularly intrigued with it because the wing has an extreme taper, and you might expect, as a result, that there would be a strong tendency for wing tip stall. Well, although Don has no washout in the tips, he did trail the ailerons in a very slight up-position for neutral, and this completely overcame any tip stall tendency which might be inherent in the design. And Don doesn't intend to find out, either. He plans to leave the ailerons alone. Smart modeler!

Incidentally, taking flight shots can be hazardous, too. On one pass I had to duck pretty fast. The Stinson SR-9C is not exactly a slow model, although not so fast as to be touchy, either. Don built it from scratch, using his own plans which he compiled from Wylam, Cleveland, and Air Progress plans and data. A lot of work, but the result is well worth it.

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Don Jacobus starting Max .40 on scale Stinson SR-9C.

Nice scale takeoff by SR-9C.

SR-9C Flyby.

Another scale job on the Pioneers' field that day was Mike Valco's scratchbuilt Spitfire. Here again, I wondered about tip stall, considering the elliptical wing. Mike didn't trail the ailerons and, unfortunately, the model had a tip stall and snapped on takeoff. Gee, you sure hate to see a lot of work get banged up like that, don't you? But Mike's a resilient type (take it easy, Mike, that's a compliment!). He will bounce back and be flying again – even if the Spit doesn't make it.

Mike Valco with his scratchbuilt Spitfire.

★ ★ ★ ★

The other activity that I enjoy – seaplanes – also came in for some

action. I got a call from Scott Christensen; he'd recently finished up his own version of the Islander and wanted to show me how it performs. So we went out to Searsville Lake and put in a few water takeoffs and landings. I took along my Wavemaster, since Scott had never seen it on water.

I was impressed by the way Scott's Islander flies since he added ailerons and dropped most of the dihedral. It really scats with the Max .15, and Scott is able to make it perform all the standard maneuvers, including the inverted spin. And as you can tell from the close-up, it's another example of meticulous workmanship.

Scott Christensen with Islander and Ken Willard with Wavemaster.

★ ★ ★ ★

This column, written early in November, will appear on the newsstands right around the first week in January, 1972, so I'd like to wind it up with New Year's greetings to all of you, and to thank you all for your letters, pictures, and diagrams. There isn't enough room to publish all of them – but that doesn't mean we don't appreciate getting them. It's great to know you're out there, having as much fun as we do. And let me finish with a little true episode.

I was out at the field recently, and as I walked out to the flight line, I saw a young lad, transmitter in hand, intently guiding his model through the sky. He was the very essence of our sport – concentration, confidence, perhaps a slight dash of concern, and underneath it all, you could sense the feeling of satisfaction, enjoyment, and just pure fun which permeated his whole appearance. So, I took a picture of him.

As I did so, a voice sounded in my ear.

"You're the cause of all this, you know," it said.

I turned. It was the boys father.

"How come?" I asked.

"Remember last spring you were

out here at the field with your Showmaster, and you had your new Kraft buddy box, and were letting any kid who wanted to, fly your model?"

"Yes, I remember. Was he one of them?"

"That's right. It was the first time he'd ever had a transmitter in his hand, and it turned him on so strong that he kept buggin' me until I just had to give in and get him a radio and a kit. And he's been flying and crashing, and building and flying and repairing, and flying again, until now you can see he can handle them pretty well. And you know what? He's got me to the point where I'm gonna' take it up myself!"

"Thanks for telling me. I like to hear things like that." I turned and watched young Jeff Skidmore fly around some more, and then left.

Sometimes it makes you feel good all over just to be a part of this great sport. Particularly when you see it bring a father and son together like that.

Have a great New Year! □

Jeff Skidmore concentrates on his R/C flying technique.

FEEDBACK

From page 6

suggests that flying may only be permitted in designated areas and only certain kinds of flying at that. Control Line would not be involved since such flying is tethered and does not actually get completely free of the ground. Free Flight, however, may be impossible in TCA situations, although limitations on size and weight may permit flying small or lightweight models.

If any controls or limitations are involved, the need for organized activity is all the more emphasized, with a safety or

control officer present to enforce requirements. This ties in with the suggestion for TCA tower frequencies to be monitored at all times. Receivers for such monitoring are relatively cheap and within the means of the clubs. But the most important point brought out in the discussions relating to these proposals was the need for someone not flying to be responsible for the actions of all others at the model field.

Along with this basic arrangement it was suggested that AMA could help provide additional incentive by voiding insurance coverage for any model flying not conducted in accordance with the TCA requirements. It was suggested that this be made part of the proposed new AMA Safety Code currently being considered by the AMA Executive Council.

Fail-safe radio control flying was also proposed. It was noted that self-neutralizing controls would not provide the kind of safety desired. In the event of radio failure a free-flying model is NOT desired. Preferred is immediate descent to earth although it was acknowledged that a crash dive was not necessarily good, either – such an event could be dangerous over spectators or unknowing general public.

A gliding model without control was felt to be highly dangerous, especially if it would be caught in a thermal and drifting out of sight. It was noted that the incident in question most likely involved such a model. It was reported to be at 2,000 feet – far above the normal RC model flying altitudes since visibility would be extremely poor (a six foot model at that altitude would be equivalent to less than one-sixteenth of an inch at arm's length). RC flying normally takes place at well under 500 ft. simply because the model has to be kept that close to be able to tell what it is doing.

With gliding or diving models not considered safe in case of control loss, a compromise solution has been suggested. This is to "dethermalize" the model; a practice now standard for free flight competition models. This would be relatively simple to do, by causing the horizontal stabilizer to deflect upon signal loss. The resultant rapid but flat descent of the model would probably be the safest situation obtainable.

This appears to be preferable to an earlier FAA proposal – back in '63 – that all models be equipped with fail-safe parachutes! This proposal was seriously considered but shelved since it might be ineffective due to the possibility of the chute providing enough lift under certain conditions to nullify the desired result. But whether by chute or by dethermalizer, the thinking is still there that fail-safe operation is desirable.

All of the proposals concerning operation and control, however, were considered secondary to the prime need for publicity concerning the problem. FAA and AMA officials agree that a maximum effort needs to be made, especially through the model press and industry, to alert all model flyers to the concern for immediate attention to safe flying practices, before something worse happens than another near collision incident.

Model publication representatives present promised a major campaign would be initiated and that full cooperation by the industry could be expected. In addition to reporting on the N.Y. meeting, regular promotion of safe flying practices was offered. It was also suggested that a campaign to provide each model flyer with a safety code would be pursued, with the object of having such codes displayed on the tool kits of flyers.

Printing of such codes could be a joint effort of AMA, publishers, and model manu-

facturers. The goal would be to saturate all outlets – clubs, hobby shops, kits, and other means of distribution – with self-stick or decal type printed codes and slogans. The need to reach all model flyers, including non-AMA members, was stressed. Those outside of organized activity are in particular need of getting the message if the effort is to be effective.

Close cooperation between AMA, model press and hobby industry leaders was promised to develop a unified approach to publicity aspects of the problem, with FAA officials to be kept informed of progress. Good communications between all parties was acknowledged to be vital. Accordingly, a distribution list of concerned people is to be prepared and made available.

The N.Y. meeting ended without specific action being taken in any direction but it was obvious that the AMA leadership is expected to pursue the proposals for eventual (soon as possible) adoption of more effective safety practices for model flying.

Also, although the N.Y. meeting was treated as a local problem it was plain that national response is expected since the same dangers apply elsewhere. Additionally, it was concluded that the dangers go beyond flying problems in TCA areas – they apply everywhere that full scale and miniature aircraft are likely to use the same airspace.

Al D'Amico, Vice-President of the Pennsylvania Avenue Radio Control Society (PARCS) and a radio news broadcaster for N.Y. station WPIX, organized the meeting as a concerned model flyer and member of the news media who felt that direct communication was needed between all interested parties in order to clarify details of the incident and any implications which might result. Also present were other club officers: Sal Alu, President, and Bob Duran, V.P. of the Pan American Model Aero Club; Irwin Perlman, President, and Richard Brooks, Secretary of the Radio Control Society of Marine Park; John Pimental, President, Blue Angels RC Club.

AMA officers present from District II (New York, New Jersey) were: Joe D'Amico, PARCS Field Controller and AMA Associate Vice President for Radio Control; Bill Boss, AMA Vice President; attending from Washington, D.C., was John Worth, Executive Director.

Don McGovern, Editor of Flying Models, represented both his magazine and others, as well as the Suffolk Falcons Club of Long Island. Another joint representative was Bob Caplan, FAA Air Traffic Controller and also a member of the Suffolk Falcons Model Club.

FAA N.Y. area representatives were: John Harris, Air Carrier Operations Inspector; E. Silverman, Operations Branch; H.C. Spiselman, JFK Tower.

Military representatives were: Commander P.A. Ammons, Commanding Officer, Naval Air Station, N.Y. (Floyd Bennett Field); Commander D.L. Muir, Executive Officer, Coast Guard Air Station, Floyd Bennett Field.

Representing the New York City Police Department, Aviation Unit, was Captain Robert Oberle.

(Report by John Worth, Executive Director, Academy of Model Aeronautics) □

VIEWPOINT

From Page 3

terror looks like until you see a guy walk away from one of these landings.

If he does! The spectators may giggle at my lack of finesse, but I had heck shaking my wife loose from the airplane and radio money. I don't want to go through that again unless it's a natural disaster!

At the beginning of this bit I mentioned the controllers and the work load they handle. To my knowledge only one accident has ever been directly blamed on a controller, and never a mid-air. If you wonder why, it's because they **never let down their concentration.** Controllers call the traffic in their area "the picture" and they always have it mentally. Every airplane; direction of travel, speed and altitude. When you fly with three other people do you always have **"the picture"**? That Ugly Stik you just passed – he's fairly slow and a beginner flying a race-track pattern around the field. The blue Kwik-Fli III is fast, he's high and doing rolls the length of the field on each pass. The red Aeromaster is slower than the KFIII, but faster than the Stik, and he's just tooling around feeling out the new airplane. There you are with the red Kwik-Fli shooting touch and go landings. Seven minutes into the flight and you are really engrossed in those beautiful landing approaches. Suddenly it crosses your mind to do a roll on climb out and run through some pattern work; full bore and up she goes. The blue Kwik-Fli never stops his rolls but he veers left to leave separation for you to climb. No sweat on the Aeromaster – he's far downwind – but where is that D- - - Ugly Stik? You forgot about him because he was flying away from your area of operation. You are about to experience what every controller lives with and hopes he is never responsible for. Out of the corner of your eye comes that Stik. Why is he so low and close when he wasn't last time you saw him? He's a beginner and he doesn't make turns by reaction yet. He is busy keeping that airplane flying. The whole situation has turned to a bucket of worms in a split second and just when you start to take evasive action your prop bites into his fuselage. The explosions of balsa, radio gear, and fabric tell you this one is a total wipe-out for both of you! Head in the cockpit? Concentration slip a little? Lose the traffic picture? Not big old experienced you! Like fun you didn't! The beginner had no business up there with so many planes in the air. Big help! Did anyone offer him that bit of wisdom? Because he over-estimated his

ability won't make all that balsa that was your Kwik-Fli jump back into a flyable airplane. That servo you never found won't reappear just because he didn't get out of your way. Take your share of the blame, experienced pilot. You let your concentration lapse for just a moment and it has cost you. You made the same mistake he did. Just be thankful that wasn't a 707 full of people on final and you let a Piper Cub get into the pattern because you lost the picture. **There are no instant replays on a mid-air.**

I realize I'm laying it on a little heavy, but at the rate our sport is growing it wouldn't surprise me that someday we will be licensed by the AMA or even the FAA, just like full size pilots. This would be rough, but with the proper attitude we could handle it. **A model airplane is an airplane.** A flying machine that shares the sky with other airplanes. If you think modelers own the sky over their flying area just try buzzing a big ship. Better yet try hitting one. From that day until forever the only thing we'll fly will be folded from paper and only then on the 366th day of leap year!

Perhaps the one other item that would fit into this discussion is weather. Here in Texas the wind can blow thirty-five knots all day and really tear models apart. The smart flyers know that if they wait until about thirty minutes before sunset the wind will usually calm down and flying is beautiful. What is the use of losing an airplane when a little patience is so well rewarded? However you should learn to fly in wind. The wind blows more than it doesn't. A little judgement and professional attitude is called for. Another little aside to weather flying. Our thunderstorms come fast and sometimes are real bears. Personally when one is close I'm not about to get out in an open field with an antenna sticking up like a lightening rod. I know people who do, and maybe I'm way off in my reasoning, but so far I haven't been welded to my transmitter!

Which seems to sum up the entire concept of this discussion. Surely we can use a little judgement and common sense to make the sport better for everyone concerned. Why not do a little reading and research on what goes into making an airline pilot or Air Traffic Controller? Those same principles can be converted to our own use, and without doubt, the day will come when we'll need them to keep flying. □