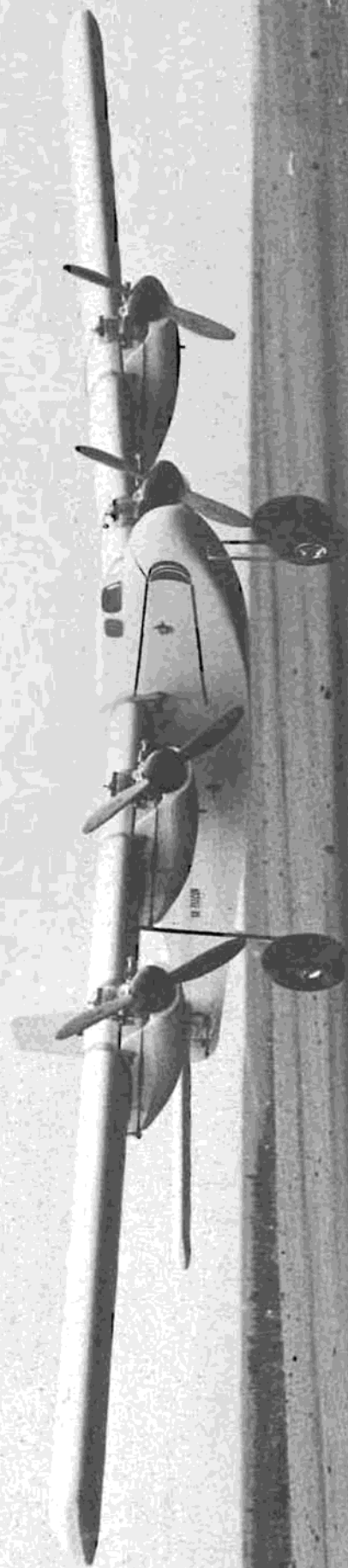


SENIOR FALCON IV



A modified Carl Goldberg Models Senior Falcon kit makes an ideal multi-engine trainer and sport ship with four Enya .15's. Weight, ready-to-fly, is 130 ounces for a wing loading of 23 ounces per square foot. Five channels are used operating rudder, elevator, motor, aileron, and brakes. Four six ounce tanks are required.

● A four engine Senior Falcon? You have to be kidding!

This is what I hear every time I bring the Sr. Falcon to the field. Seems to be appropriate words though, but I am **not** kidding.

How would anyone ever venture into a project like this? Well, it seems ever since I started flying R/C models, back some 8 years ago, I dreamed of some day having a four engine craft of some kind. I think that every RC'er has thought of building and flying a big four, at one time or another. You say, "One has enough trouble with one lousy engine, let alone four." Well, that could be true, but I figured if I took my time and moved up to a project like this using a reliable proven flying platform, the project would go smooth and easy.

I started by selecting, as I said, a stable platform to work from. I wanted something that was a proven flier and had a lot of wing area. Looking over the scale jobs available, showed me nothing but disappointment. What you hear and see is nothing but trouble if you are not a super experienced pilot. If I wanted something to fly I had better forget about anything on the market that had multi-engines. It would be sheer disaster with my experience. I wanted my four engine turning bomb to fly, and as easily as possible. You see, I know my capabilities and wanted something that took very little hassle to become airborne. I consider myself a typical Sunday flier.

BY GEORGE STEINER

My experiences with the Carl Goldberg Falcon group seemed to be what I was looking for. The Sr. Falcon would be ideal to modify and, besides, I already had a kit on hand. The wing area was large enough to pack the extra load that would be impressed on it. The basic airframe was strong, straightforward, simple to build, had no compound curves, and I knew that basically it would fly.

All I had to do was concentrate on the engine nacelles and that horrible linkage that would drive anybody up a wall. But as you read on, you can see how I solved the linkage problem. Remember this project objective was to have a multi four-engine plane that didn't take a super expert to get it off the ground and back.

One of the first things I did when planning to get the project off the ground was to select the power plants. Like a lot of things in life, you tend to follow the direction of least resistance and, at this time, I just happened to have two Enya 15's, half-way there so to speak. All I had to do was find and purchase two more. This was no problem. One at one hobby shop and another at another one. To top it off, one of my flying friends gave me a well broken-in one. This all turned out to be a big mistake and caused most of the irritating problems of this project. So what I recommend is that, when purchasing your en-

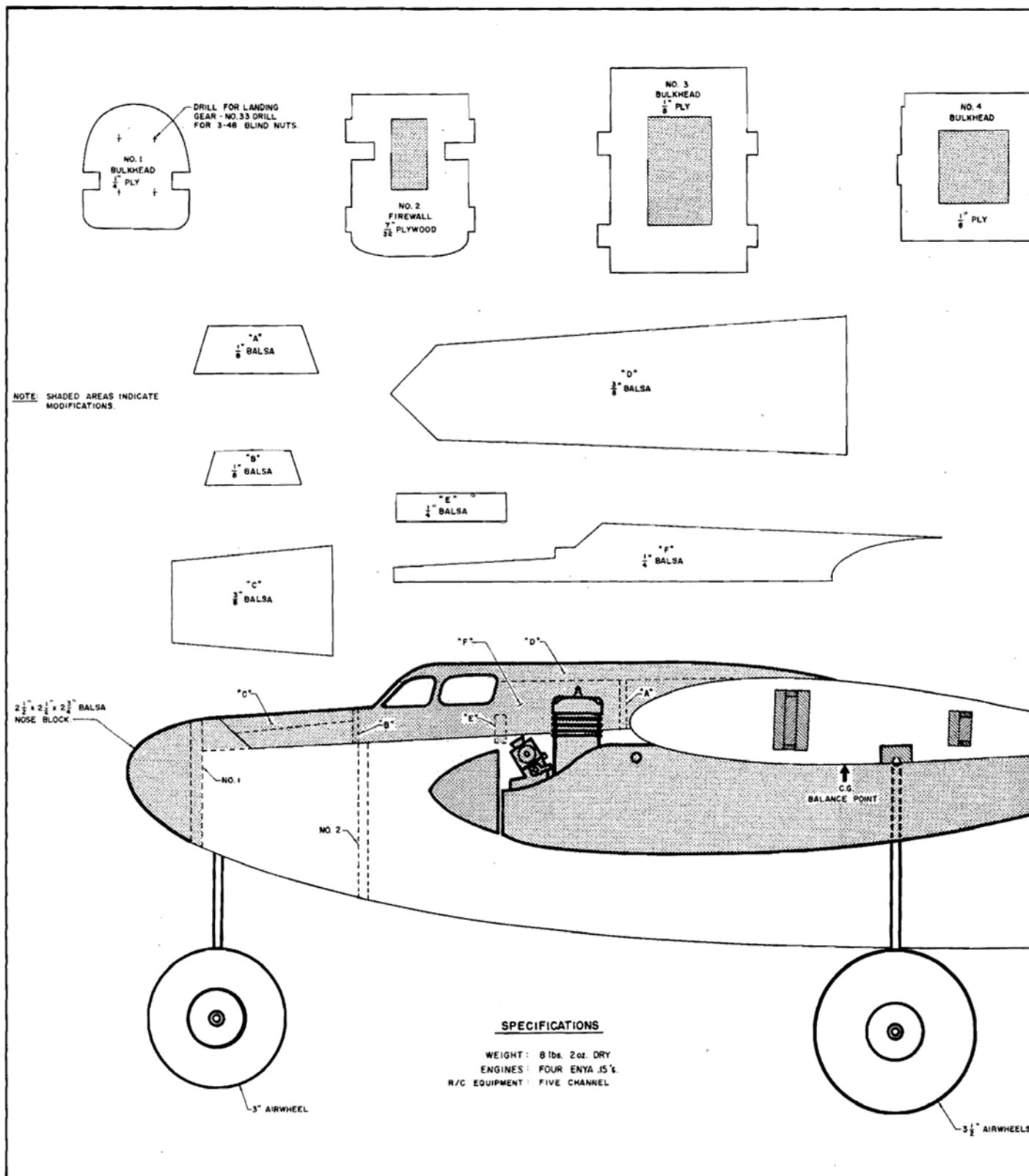
gines, get them all at once from the same place and, hopefully, they will be out of the same mould. Out of five engines to fool with, they all ran at top rpm differently. It has taken many hours of block testing on the bench to get them broken-in to the point of being synchronized. Be sure to run all of your engines real well if you intend to take on this project. Note the little difference between each so when installing the engines you can balance the power output on each side.

The construction of the engine nacelles seem to be in order at this stage. If you can't get through making your engine nacelles, you can forget the whole project. The nacelles are time consuming but once you get started it's not all that bad. In looking over the nacelle's layout, the best way is to start by gluing formers N-2 and N-3 to the hardwood motor engine rails. N-1 can be glued after N-2 and N-3 are dry. N-4 was glued to the tail block to give an idea for its shaping. Place the 1/8" side sheeting on and glue the tail block in place. Do the bottom sheeting next. These should be a bit oversize so sanding will let the quarter side planking fit snugly.

N-5 is glued in place later after the mounting dowels are put in place. It is best to wait until the wing is under construction before gluing or epoxying the dowels in the nacelles. This will be done after the "P" blocks have been drilled and placed in the wing.

Author George Steiner with his Senior Falcon IV.





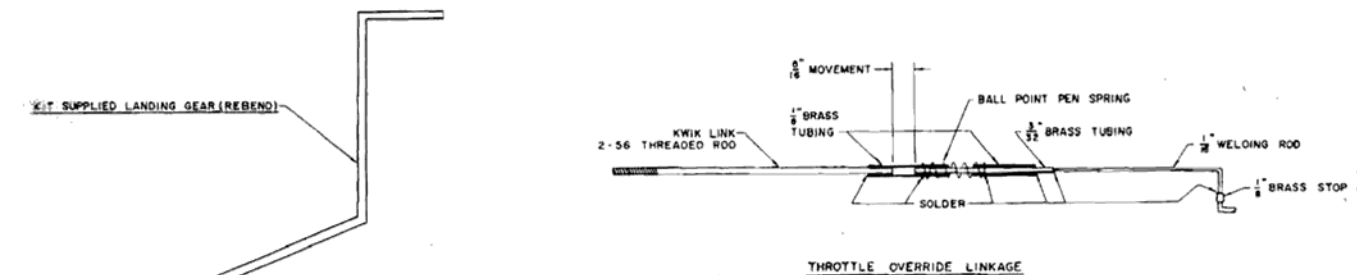
When installing a 6 ounce square tank in the nacelle, you will notice that it is a bit too large for the space. This is remedied by placing the plastic tank in boiling water for a minute. Remove and press the tank down into the nacelle so that it fits snugly. If you blow it, and the tank shape is wrong, just place it back in the boiling water. The tank will return to it's original shape. You can start all over again. Don't let the tank stick up above the top edge of the nacelle. A four

ounce tank will work but, when fooling around with four engines at the field, one needs that extra fuel for time so you don't have to hurry. The 6 ounce tank and 15 engine will give a guaranteed 15 minutes of running time.

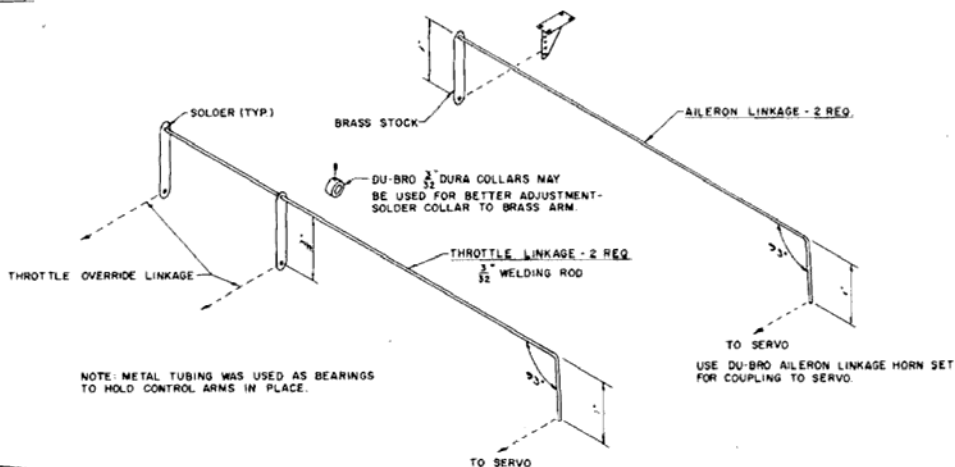
At this point, I want to point out the reason for using the ugly #64 size rubber bands for holding on the nacelles. The little bit of flexibility with the foam cushion between the wing and nacelle is well worth it.

Vibration back to the receiver and servos in the wing and fuselage is almost eliminated. Also, inspection of the fuel tanks can be easily made. On one occasion, after a run, the clunk in the tank fell off. You can see that a repair job is made easy without major surgery.

To get started with the wing is no big task. Use and follow the building format that comes with the kit. But, before you frame up the wing over the plans, be sure to alter a



NOTE: USE NYLON CLEAVISES ON ALL LINKAGE.



NOTE: KEEP RADIO GEAR AFT OF C.G. BALANCE POINT IN THIS AREA OR SHIP WILL BE NOSE-HEAVY.

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SR. FALCON IV

FOUR ENGINE CONVERSION

DESIGNED BY: G. STEINER
INKED BY: S. PELANDINI



SHEET 1 OF 2 - FUSELAGE DETAILS



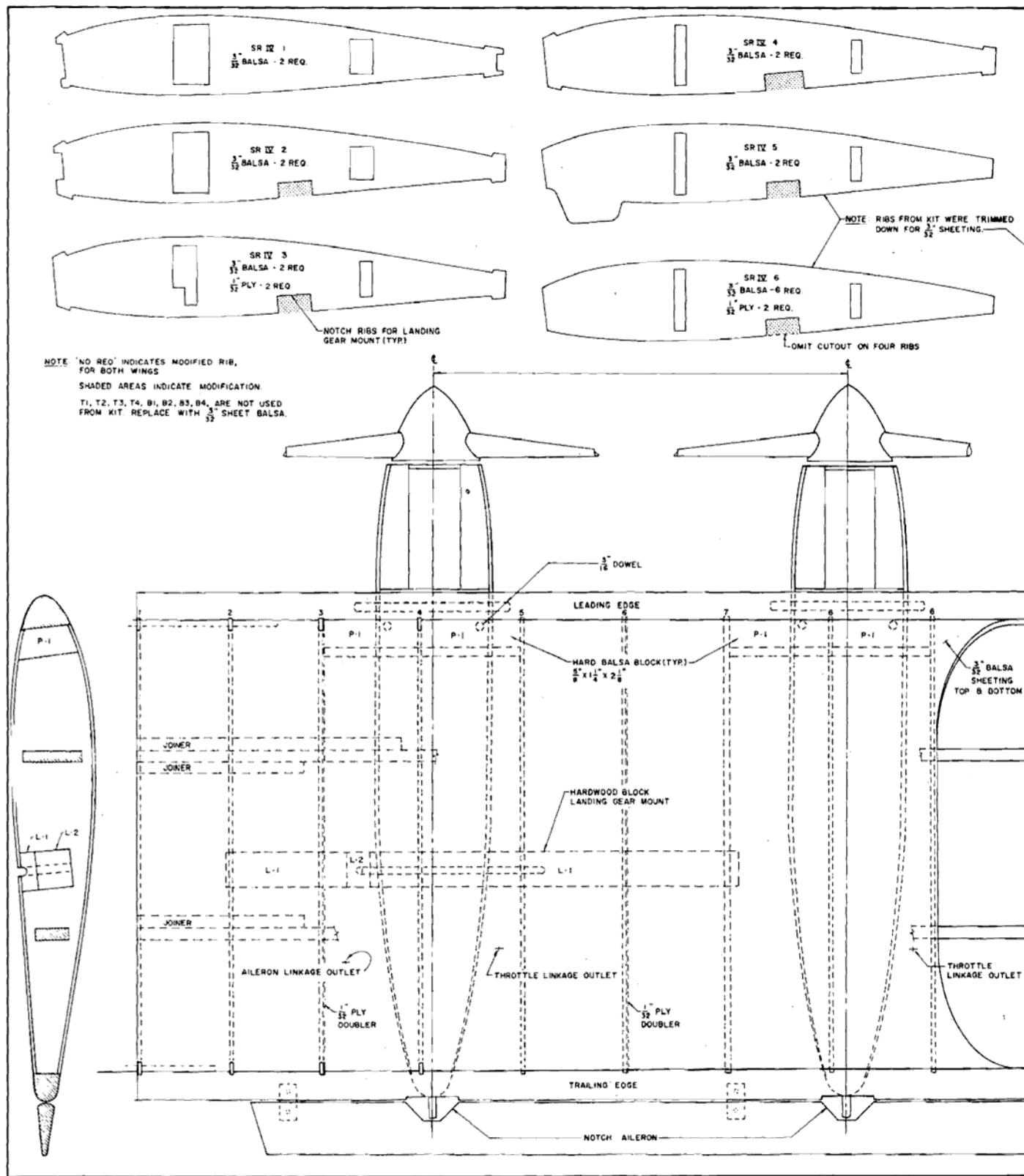
② PLAN NO. 660

few of the ribs. These are shown on the conversion plans. Four extra 1/32" ply ribs will have to be made to help support the landing gear mount. They are used as doublers. Don't forget to trim the ribs as noted, otherwise the sheeting won't lay down right. In the kit they use 5/64" sheeting. This is such an odd size, I don't think it's too readily available. Just go to a more standard size of 3/32" balsa. A little more sanding might be required, but the extra strength is

worth it.

You will note on the conversion plans that part "T" and "B" that come with the kit are not used. The use of one piece sheeting for the wings from the root to the outboard nacelle, along with the long hardwood landing block, gives an almost indestructible wing base. After gluing the P-1 blocks in the wing, fit the nacelles in place. (No sheeting on top or bottom as yet.) Drill the holes and glue the mounting dowel into the nacelles.

Sheet the bottom then and fit in the nacelles once again. Be sure to use some sort of pressure sensitive foam cushion between the nacelle and wing when finished. The engines can be fitted now. The offset for the engines is noted on the plans. Make sure the distance between the nacelles and the center of the wing is as shown on the plans. This will let a 9" prop swing with ample clearance. The control linkage and servos should be placed in the wing at this time. It has a



very direct advantage in getting all this set up before proceeding to the top sheeting.

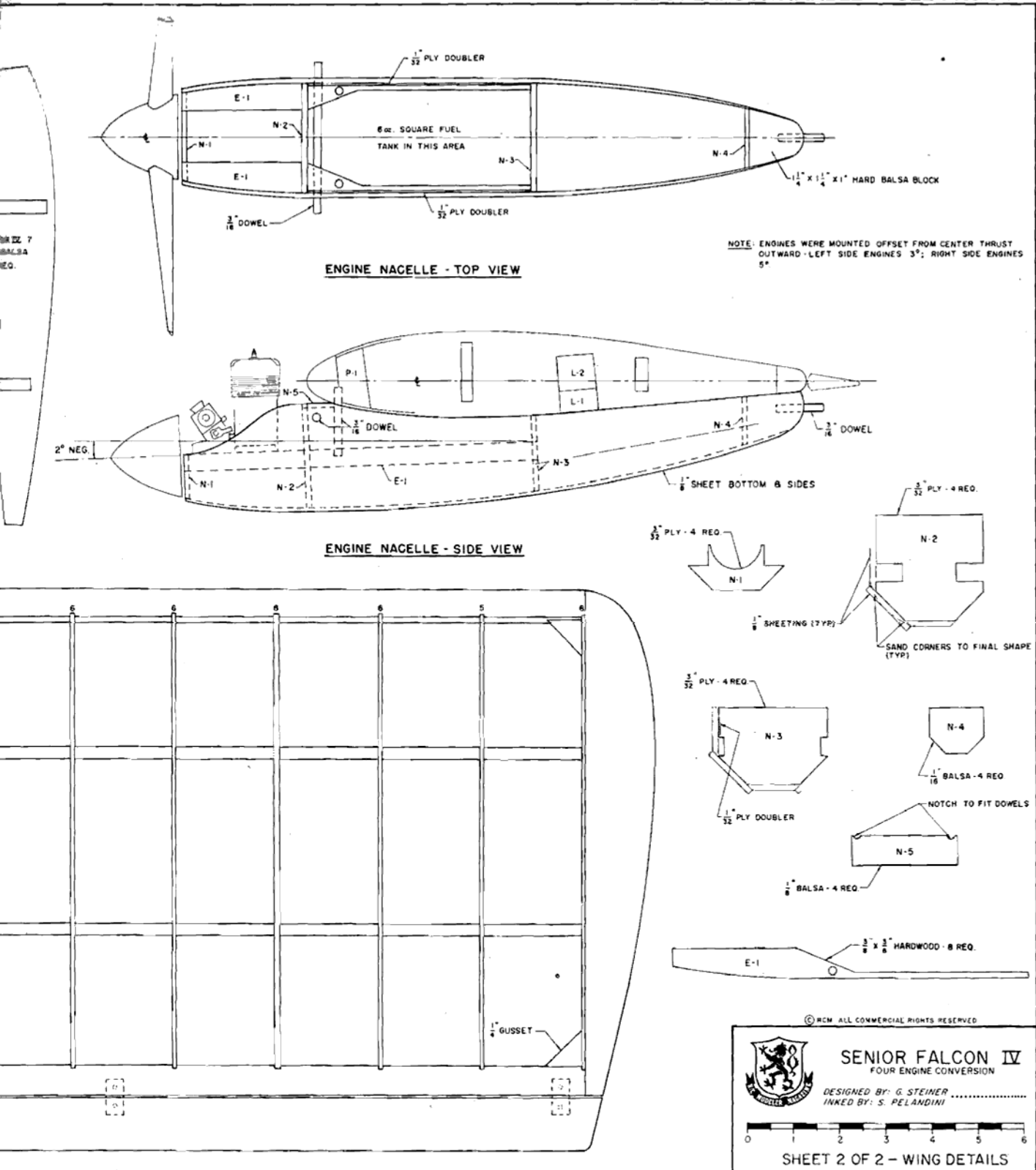
The landing gear with the fitting of L-2 can be more accurately placed without the top sheeting. The main landing gear that comes with the kit can be used if re-shaped. I recommend making a new one as shown on the plan. The brakes will fit better if you intend to use them and can be routed at this time. Use a piece of NyRod as a conduit for this. Brakes are very important because the

ground handling can get out of hand if not used. Four engines at a fast idle will make your plane a runaway. Get it all working first and you will end up with a very smooth, clean job.

The linkage on the conversion plans gives a type and method I used. It has been very trouble-free. It works so freely that a small KPS 12 has no trouble in operating all engine throttles at the same time.

The throttle override linkage was the

easiest way to take any kind of burden off the throttle servo. With all four engines going to full open or full closed, some simple way had to be devised to position them all at the same place at about the same time. Giving it some thought, you will see that 90% of the time the throttles are either full open or down on the stops in idle. The override spring linkage, made from a ballpoint pen, gives that soft stop so as to prevent any hang-ups between servo and



engine. Here again I want to stress that in order to have a trouble-free engine group, be sure all linkage works before sheeting the top of the wing. If Duro Collars are used on the control linkage, it will enable you to completely remove the controls at anytime. This makes it easier when you get to the covering.

The fuselage and tail group can be easily constructed with material out of the kit. No modifications are needed from about the

C.G. point back to the tail.

Omitting some of the detail work around the existing kit landing gear mount assembly is one of the things you could do. Be sure to do the cut-outs on formers 2, 3, and 4 as shown on the conversion plans. You will have to make new #1 formers as shown. Even though no engine is going to be in the nose, the birch engine barriers were made and glued in place. They are needed to help support the nose and landing gear.

In the kit B-1 has a cut-out on it. This is part of the bottom fuselage sheeting. Punch it out and then just glue it back in. A hole will have to be made for the landing gear in the large balsa block, making up part of the bottom of the fuselage assembly forward of B-1. Before the forward 2½" x 2½" x 2¼" balsa nose block (not supplied in kit) is glued in place, fit the nylon nose landing gear mount to the new former #1. The

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nylon mount will have to be notched out in the middle to allow the use of a steering arm in the middle of it. If not, it will interfere with the hatch.

Before sanding the nose block to its final shape, it might be well to hold off till the hatch has been built.

The pilot's cabin hatch is constructed per the conversion plans. When constructing it, you will want to make it a bit oversize. This is done in order to make a tight fit ala sanding. 5 minute epoxy was used here to speed things up. This hatch requires no strength, so soft balsa was used. When ready to fit the hatch, place the wing on the fuselage. Use masking tape to hold a piece of sandpaper over the top leading edge of the wing. Move the hatch back and forth to acquire the shape and fit to the wing. Balsa part "E" will be glued in place later. Be sure that the forward part of the hatch is against former #1.

Now with the hatch fitted, place some glue on the face of former #1 and the face of the hatch. Not too much, but just enough to let the forward parts become glued together. Set the hatch in place and hold down with masking tape. While this is in position, you can finish sanding the nose to shape. When dry, take a razor saw and cut at an angle as shown on the conversion plans. Off comes the hatch (you hope). The windows were routed out with a Moto-Tool. Clear MonoKote was used for the windows.

Covering turned out to be real easy using MonoKote. The only places I was unable to cover were the nose and engine nacelles. There I used Epoxy paint to match the MonoKote.

The radio installation was kept as far back as possible. Quite often a Sr. Falcon comes out tail heavy, but not with four engines hanging on it. The Enya is somewhat heavy for its size, so if something else like OS engines are used, you might not have to be so concerned. As it turned out, the C.G. balance point came out just as prescribed in the kit plans.

When finished, be sure your angle of attack is on the right plane. Don't let the nose position become too negative. It'll take forever to take-off. Position the nose gear height with the steering arm lock screw — this should give you the adjustment needed. The angle as shown on the plans works well (relationship of nose gear to mains).

The best way to describe the flight characteristics is to tell what happened on the Senior Falcon IV's maiden flight.

Belonging to a large R/C club, I, like any RC'er, brought it to the club meeting. I had just finished it and wanted it for show-and-tell. The remarks, like I said, were "You got to be kidding, a 4 engine Falcon?" Well after everybody stood agasp and picked it apart, they badgered me into saying I would fly it the next day at our club field. "My gosh, what am I saying?" I thought to myself. No, that isn't what this project was all about.

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If one was to realize success, I would have to follow through.

The next day at the field there was a crowd of fellow fliers eager to help in any way.

I got with it just like it was a single engine job. I fueled up #1, 2, 3, and 4 engines, got the electric starter out, and started #1, 2, 3, and 4. I ran the engines up and down. Oh what a sound! My legs felt like Jello. I opened the throttle and checked each engine for top rpm. A little tweak here and a tweak there. Everything was ready. I taxied out to the runway with everybody watching. Once on the runway, I turned into the wind and, looking down the runway, set the brakes. Again, I ran the engines up and down to clear them out. I took my left hand off the transmitter for a moment and rubbed it on my pants to wipe off the castor oil. I then released the brakes and pushed the throttle full forward and off it went.

You know what? It flew! It took off so smoothly, I couldn't believe it. It went right straight down the runway. I put in a little aileron and made a nice gradual right turn and flew back over my head at a hundred feet of altitude. I had succeeded! In fact, this plane was easy to fly. It handled so smoothly, I could hardly believe it. All the trim adjustments were right on.

"Wow!" I made a couple of 10 foot high off-the-deck fly-bys. What a thrill! The type of approach I had taken had paid off. A Sunday Flier can handle a four engine machine with ease. Before the flight was over, I even did a loop or two. The landing was very deliberate and smooth.

Since then I have made many flights. It is an extremely stable craft and it really grooves through the sky. I really enjoy flying it. A simple approach has paid off in producing a stable multi-engine plane. The sound of the four engines screaming by in the sky is a real show stopper. Try it and I know you will also enjoy every minute of it as I have.

One final thought. The type of flexibility of construction this conversion lends itself, one could even leave off the two outboard nacelles. This would make a very impressive twin. The nacelles are large enough to hold two S.T. 23's. If done though, watch out for the C.G. The radio gear will now have to be placed well forward in the fuselage to make the balance point come out. As you can see, I have given the twin idea some thought. Maybe some day I will try it, but for now, I am hooked on the four. □