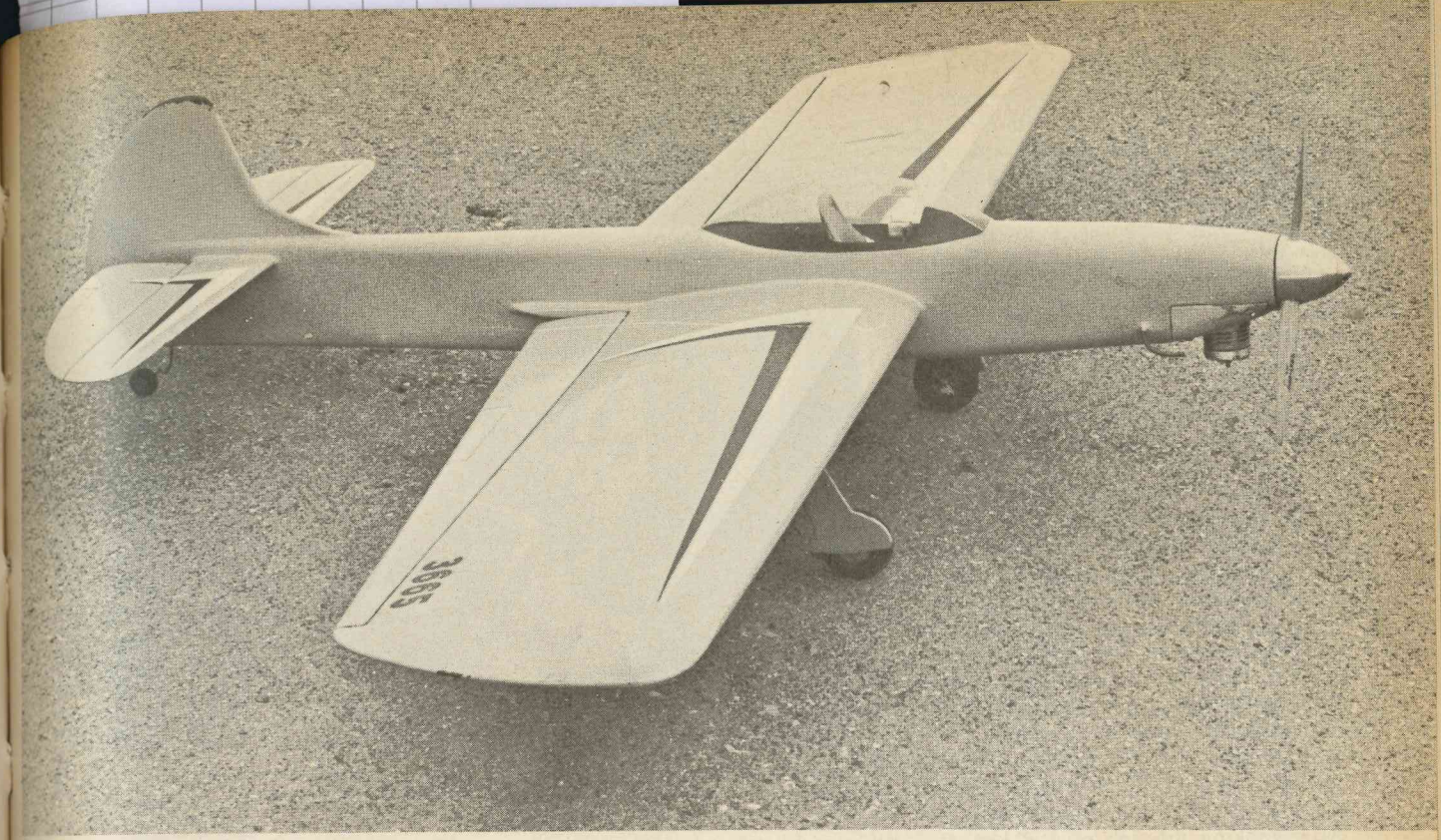


Dale Sparks tried wing mounted gear on his Oriental; very successful on hard surfaces but placement is a bit too far aft for grass landing areas.

Tommy Morgan, Odessa, Texas, won 1968 Junior Stunt at Olathe Nats plus many wins at local and regional meets; functional airframe best for juniors.

By DEE RICE

Foreword by Bill Netzeband

● *Since 1948, when the flapped symmetrical airfoil stunter appeared, at least 500 stunt machines have been published and some 50 more have appeared as kits. Each of these was the ULTIMATE winner according to the designer, and truly each of them had won quite a lot of hardware. Question—where are all of these winners now? Answer: Replaced by a better ULTIMATE winner created by the same designers (and some new ones). Problem: Each machine was developed, as opposed to engineered, resulting in a supercritical layout strangely suited only to the designer's style of piloting.*

The Oriental, designed by Dee Rice, is a rare bird. It is a happy combination of geometry and construction that allows it to be built with a variety of CG locations and weights and still function at a competition level. Its builders include juniors, sport aerobats, and serious competition types, and they are ALL enthusiastic about its performance.

Getting Dee to release it for publication wasn't easy (he's modest) but we feel that it's an airplane that needs to be spread around (no pun intended, Dee). Until that ideal transition *stunter comes along, the "Oriental" should get you over the fence from profiles into competition stunt. We are proud to present the* Oriental *for your information and* action. *(Continued on next page)*

THE ORIENTAL

A rare combination of aerodynamics makes this machine suitable for the competition flyer and his sport colleague as well as junior builders. Contest record has been outstanding, and the author may have developed a classic. MAN's "Wild Bill" feels this stunter deserves attention.

THE ORIENTAL . . . CONT.

In the early days of my career in precision aerobatics (the mid 50's), I was fortunate to be able to associate with two of the finest flyers and designers in the country, George Aldrich and Don Still. However, I got most of my help from Ralph (Bud) Tenny, well-known in indoor circles. Bud introduced me to contest flying, and I flew his design in combat for many years, placing third in the '56 Nats with it. The reason I am mentioning these three gentlemen is because they played an important role in the design of the "Oriental."

George and Bud would have to share credit for about three-fourths of the aerodynamic design with one-fourth given to me for integrating their sometimes opposing views. Don Still's construction technique for the basic wing and the fuselage was copied, almost exactly, from his famous Stuka Stunt. This speed and simplicity of construction is the heart of the Oriental.

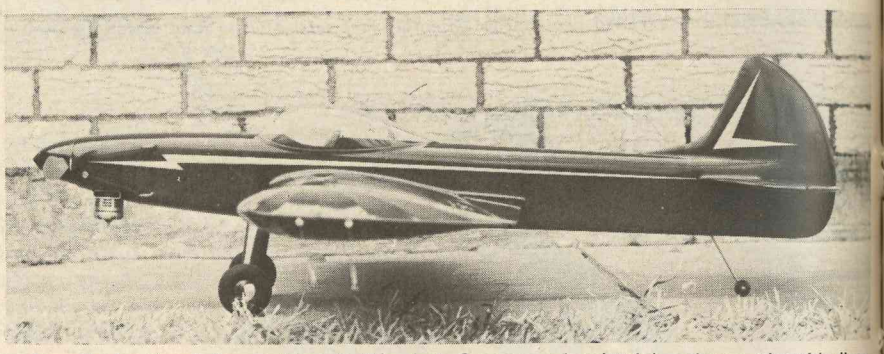
In August of 1957, after wearing out my third Nobler, I reluctantly went to the local hobby shop for number four. After looking through several kits, trying to somewhat pick the wood I'd be using, I suddenly thought . . . "There's *got* to be something easier to build." So I went home with, not a new kit, but about $4. worth of balsa (Man, those *were* the good old days! Knowing very little about aerodynamics (probably even less now), the first thing I did was lay out an airfoil section, reasoning my french curve was about as good as anyone else's. Two weeks later the first Oriental was completed. The nicest thing about it was that it took less effort to build than any kit stunt ship that I had ever built.

Now, I am one of the guys who charges to the local school parking lot the minute he finishes a new ship (sometimes before) regardless of the weather; but, as luck had it, it was a beautiful day, for Texas. A nice steady 10 mph wind and clear sky. The Oriental flew just fine with only minor adjustments made by slight twisting of the flaps to level the wings. It did everything I asked without a bobble, wiggle, or sign of a stall. It flew beautiful sharp-cornered squares, and overhead maneuvers, and grooved like it was sitting on a table. Twenty flights and a week later the Oriental won the Southwest Model Airplane Championships in Dallas. Since then, it has won more contests in the Southwest than any other ship, except perhaps the Nobler.

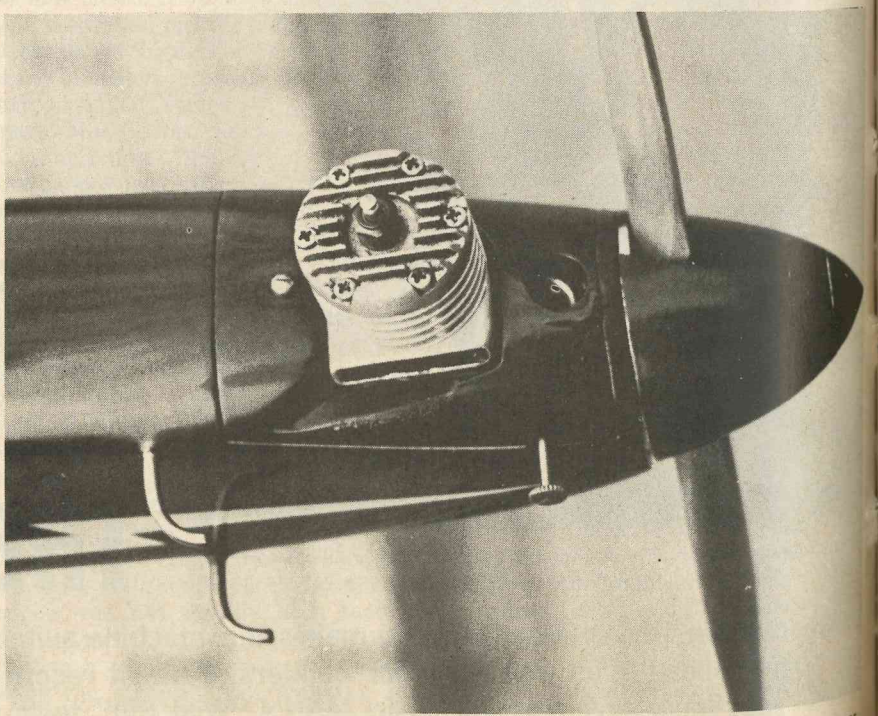
Unlike many designs which, over a period of time, go through a series of design changes, the Oriental I fly now is almost identical to the original. The

(continued on page 54)

Designer Dee Rice (left), hears the virtues of Stan Brock's long tail wheel strut discussed at great length. Light weight necessary for top performance: 41-43 ounces best flying weight.



Smooth, functional lines evident in this shot. Canopy and paint job enhance aircraft's lines.



Close-up of standard engine cowl; tank modifications shown on plans. Fox .35 for power.

The Oriental

(continued from page 14)

changes made in later models were mostly for appearance.

This ship has had great success with flyers of all levels of experience. For the new-comer, it is a snap to build and very smooth and safe to fly. For the advanced flyer it offers contest flying at its best with a minimum of construction time. Speaking of contests, I would like to mention that Tommy Morgan of Odessa, Texas won first place in Junior stunt at the Nats in 1968. I am very proud of this young flyer and very pleased that he chose to fly an Oriental. I feel that this plane deserved a Nats' win . . . especially since I sort of, er, ah . . . choked in the finals at the '64 Nats and placed sixth instead of getting this fine ship a Nationals' trophy. Oh well, that's another story.

Like all models, this one needs to be light. Most of mine have weighed from 41 to 43 ounces with very little effort given to cutting down weight. I know of one which weighed 37 ounces, and another which bent the scales at 56 ounces. This 56 ounce ship had such heavy wood in the tail that it took nine ounces of lead around the engine to make it balance. The wood selection is not at all critical, but, please, make the following choices: (1) fuselage top block—the lightest piece of 1/2" sheet you can find. (2) stab—hard contest balsa, (if you use 3/8" instead of 1/4", use the lightest wood you can find.) (3) rudder and elevators—any good grade of light contest balsa.

There is another item which I consider very important in construction: epoxy the wing, rudder, and stab to the fuselage and make fillets out of several layers of epoxy. An easy way to do this is to smooth on a layer of epoxy to all fillets just before stopping construction for the night. After three evenings the fillets are made. By using epoxy for the fillets you should never get a fatigue crack at the leading edge of the wing or stab. One nice side effect is that once the stab is positioned parallel to the wing, it will stay there. Epoxy, unlike solvent release glue, does not shrink while curing. It's the shrink in glue that causes unwanted stab tilt, and such.

The construction part of an article is usually overly detailed and, to me, rather confusing. However, now that I have actually had to write a "glue this to that" section, I can understand why it has to be detailed, especially for a design which appeals to beginner and expert alike.

I generally *don't* build one item at a time (i.e., complete the wing, then the fuselage, then the stab,) but work on the entire model. While the glue is drying on one item, I work on another part. There are very few times during the construction of any model that a person cannot find something else to work on while waiting for glue to dry.

The first item in construction is to splice spars, leading and trailing edges. While they're drying, cut out the ribs, fuselage sides and the plywood formers. By now, the first items glued will be dry, and you may start actual construction wherever you like. I generally begin by assembling the ribs to the spars and attaching the leading and trailing edges, holding them in place with pins and rubber bands while the glue dries. Spot glue all the joints. Since I've never had much luck with pinning a symmetrical-sectioned wing down on a flat board, I build by holding the wing in my hands, and twisting the wing until it's straight.

After the spot glued wing is dry, remove the pins and rubber bands and check again for straightness. If the wing is twisted or warped, simply twist in the opposite direction until you hear the spot glue joints start to give, then recheck the wing. Continue this process until the wing is straight. Now, completely glue all of the joints of the wing. When the glue is dry, install controls and tip weight as shown on the plans. Plank the wing, add cap strips and wing tips. Check from time to time during construction to see that the wing stays straight.

There is an easy way to determine the proper amount of tip weight for your Oriental. Take your airplane, complete except for covering, and lay it upside down on a smooth, flat surface. The airplane should rest on the inboard wing tip at this time because of the extra weight of the longer inboard wing and the lead-outs. Add weight to the outboard wing tip until it settles to the table, raising the inboard wing. The weight should be adjusted to the minimum amount which will cause this "see-sawing" action. Glue the weight in the wing tip with a healthy glob of epoxy.

The first step in building the fuselage is to glue the engine mounts to the fuselage sides and install the doublers. While this is drying secure the landing gear to the rear plywood former with "J" bolts. Be sure to put a dab of glue on the nuts and threads of the "J" bolts to keep them from vibrating loose. Assemble the fuselage by gluing the fuselage sides to the plywood formers. NOTE: Be sure to install the tank during this step. If you wait until later to install the tank, you will have to cut a slot in the fuselage side to clear the tank vent so that you can slide the tank into position. After the plywood formers are dry, pull the fuselage sides together at the rear and glue to the tail post made from 3/32" scrap. Install the 1/4"x 1/8" fuselage spacers approximately where shown on the plans. The location may be varied slightly for best fit. The natural curve of the fuselage sides should not be changed.

To begin final assembly, remove sections of the fuselage sides below the wing cutout and epoxy the wing into place. Replace the fuselage sections just removed and strengthen the area of the cuts with balsa doublers inside the fuselage. After the wing is secure, install the pushrod between the flap and elevator control horns. Place the flaps in neutral and slide the stab forward or rearward to position the elevators at neutral. If you have to move the stab more than 1/8" from the position shown on the plans, bend another pushrod. Now epoxy the stab in place with the pushrod installed.

Place the engine temporarily in place, taking care to offset it toward the outside of the flying circle by approximately 1½°. Drill the engine bearers and install the 4-40 blind mounting nuts. As a rule of thumb, you have enough engine offset if you can see at a glance, when looking from above, that the engine is pointing slightly outward.

Finish assembly by adding the tail wheel, bottom planking, plywood spinner ring, bottom block and rudder. Do *not* use rudder off-set.

I show a small cowl on the plans because removable cowls are an accepted fact among stunt flyers. However, I highly recommend making the cowl an integral part of the fuselage. I saw another Oriental built this way and was impressed with the simplicity and practicality of the idea. This is done by carefully trimming around the cylinder opening until the engine will slip in and out of the fuselage with minimum clearance. There will be enough room to slip a screw driver in beside the engine for tightening mounting screws.

The fuel line can be connected to the engine with needle nose pliers. The opening around the engine will almost disappear if the interior of the engine compartment is painted the same color as the surrounding exterior. This works especially well if a dark color is used.

I usually finish my Orientals with nitrate dope and Hobbypoxy. Commercial nitrate dope is cheap, low shrinking, high in solids and forms a particularly good base for Hobbypoxy. Do not use nitrate on an exterior, however, as it is *not* hot fuel proof. If you use the 1/4" sheet stab, be sure to cover it with silk or silkspan. This makes the stab considerably stiffer so that there will never be a chance of stab flutter.

The Oriental has two design features uncommon to most stunt ships which I feel merit a brief explanation.

First, I use a 3.5 or 4-ounce Veco tank, modified as shown on the plans. This tank system has been in all of my airplanes since 1955 and it works great. The needle setting for a Fox 35 with a 10-6 prop is made as follows: with the engine running, turn the needle valve in until the engine just barely breaks into a two-cycle. About one lap after launch the engine will drop back into a strong four-cycle, returning to a two-cycle operation only during maneuvers. As the end of the flight nears, the engine will break back to two-cycle several laps before it runs out of fuel. This gives both an excellent run for the pattern and ample warning before the engine quits.

Second, I used 1/2" square engine mounts. The Oriental is slightly wider than most stunt ships to make room for the installation of a standard size Veco tank without having to leave out the fuselage doublers in the tank compartment. This extra width allows for the use of the larger mounts to dampen vibration and increase strength in the critical area of the engine mounting holes. I've seen many stunt ships with 3/8" wide engine mounts damaged in hard, nose low landings, where the inverted engine hits the ground. The narrow mounts frequently break at the rear holes when the airplane may be otherwise still flyable.

Flying: If you are not an experienced flyer, the first few flights should be made with the CG slightly ahead of the location shown on the plans. I set my Orientals up with the CG as far forward as possible so that I must use all of the control available to do a smooth, square corner. This makes a very insensitive airplane. Don't copy blindly though, put that CG where you feel most comfortable. You can tailor the flying characteristics of the Oriental to your own taste by experimenting with CG location. Move the CG forward for smoothness and stability — move it rearward for tight turning and quick, sharp corners with very little loss of "grooviness."

During the first flight, watch for any tendency for your Oriental to fly with one wing low. If this happens, twist the flaps toward the low wing enough to bend the control horn slightly. For example, bend the left flap down and the right flap up to raise the left wing. Do this carefully, about 1/8" at a time, taking care not to break the surface of the flaps with the control horn wire.

The Oriental's take-off and landing characteristics contribute greatly to its reputation for being easy and fun to fly. The gear is set up for the easiest wheel landings ever. On grass just let her roll on. On hard surface, feed in full down just as the wheels brush on. There is little or no tendency to bounce and it usually rolls about a half of a lap on landing with the tail high. The combination of a steady, groovy glide and unsually good wheel landing characteristics make the beginner look like an expert and the expert look like a master. This very desirable characteristic is lost if the wheels are moved forward more than 1/4" from the position shown on the plans. I've seen it happen, so don't say that I didn't tell you.

Good luck with your Oriental and good flying. ■

Digital Servo Tester

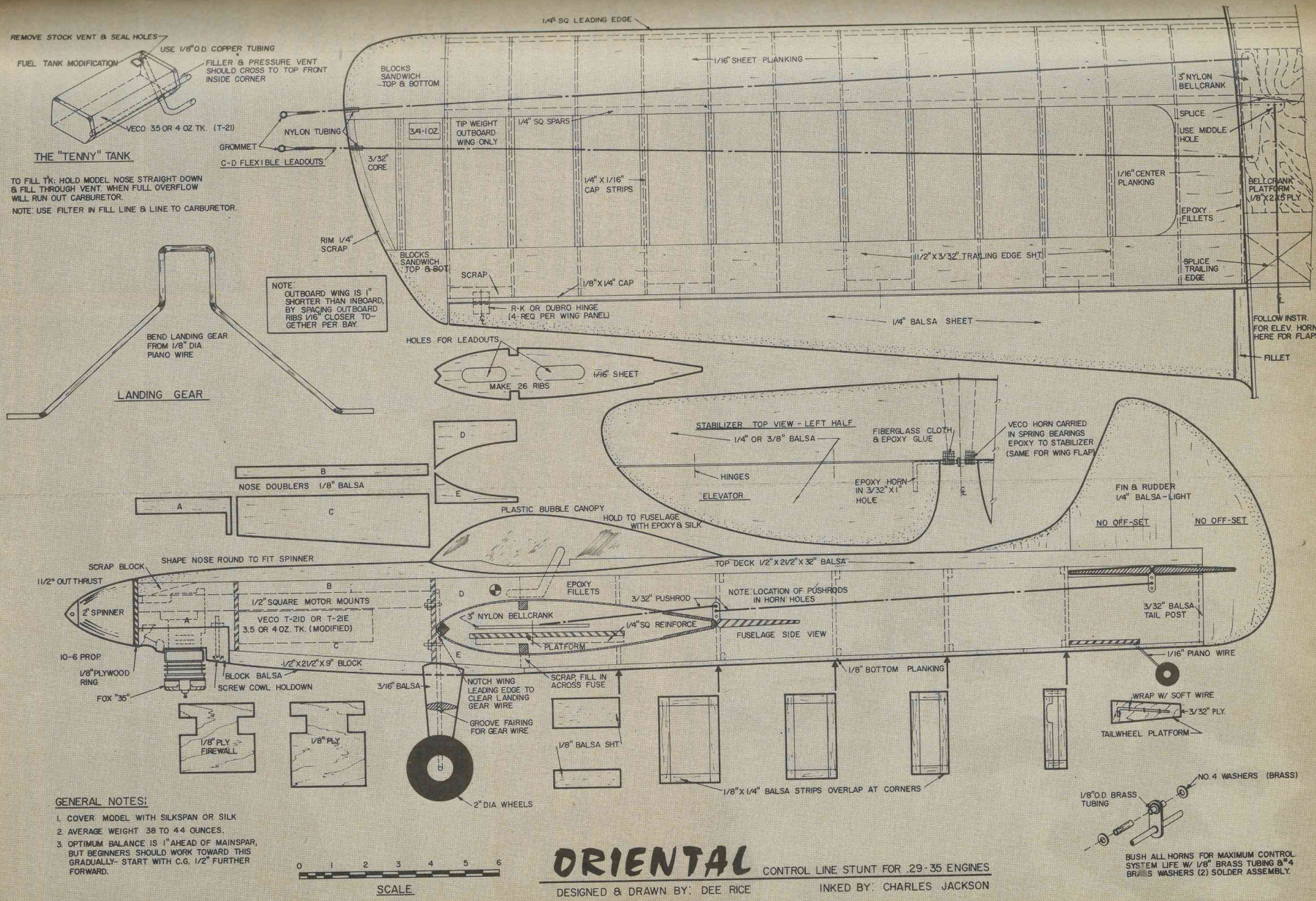
(continued from page 34)

check some servos that I have been building and when I found that none of them worked when connected to the receiver, I naturally connected them up to the servo tester. I then found that they worked very well when I lowered the frame period from 20 ms to about 8 ms. Since all four servos worked exactly the same way I felt that I either made the same wiring mistake in all four servos, or that there was a mismarked component. As it turned out I misread the value of the pulse-stretching capacitor and instead of a 2.2 mfd capacitor it turned out to be a .22 mfd. This kind of an error would be very hard to find if all you had to use was your R/C system.

THE "AMONG OTHER THINGS"

As I mentioned earlier, this started out to be a square-wave and pulse generator. For those of you who are interested, here's what I intend to do. I plan to incorporate a range switch calibrated in frequency for the square-wave generator. This switch will switch in different values of capacitors and, along with the frame control (R-11), will give you a very wide range of frequencies.

I should be able to go from about three or four cycles to about 300 KC, which I think is the upper frequency of the inte-



GENERAL NOTES:

1. COVER MODEL WITH SILKSPAN OR SILK
2. AVERAGE WEIGHT 38 TO 44 OUNCES.
3. OPTIMUM BALANCE IS 1" AHEAD OF MAINSPAR, BUT BEGINNERS SHOULD WORK TOWARD THIS GRADUALLY- START WITH C.G. 1/2" FURTHER FORWARD.

ORIENTAL

CONTROL LINE STUNT FOR .29-.35 ENGINES

DESIGNED & DRAWN BY: DEE RICE

INKED BY: CHARLES JACKSON

FULL SIZE PLANS AVAILABLE—SEE PAGE 64