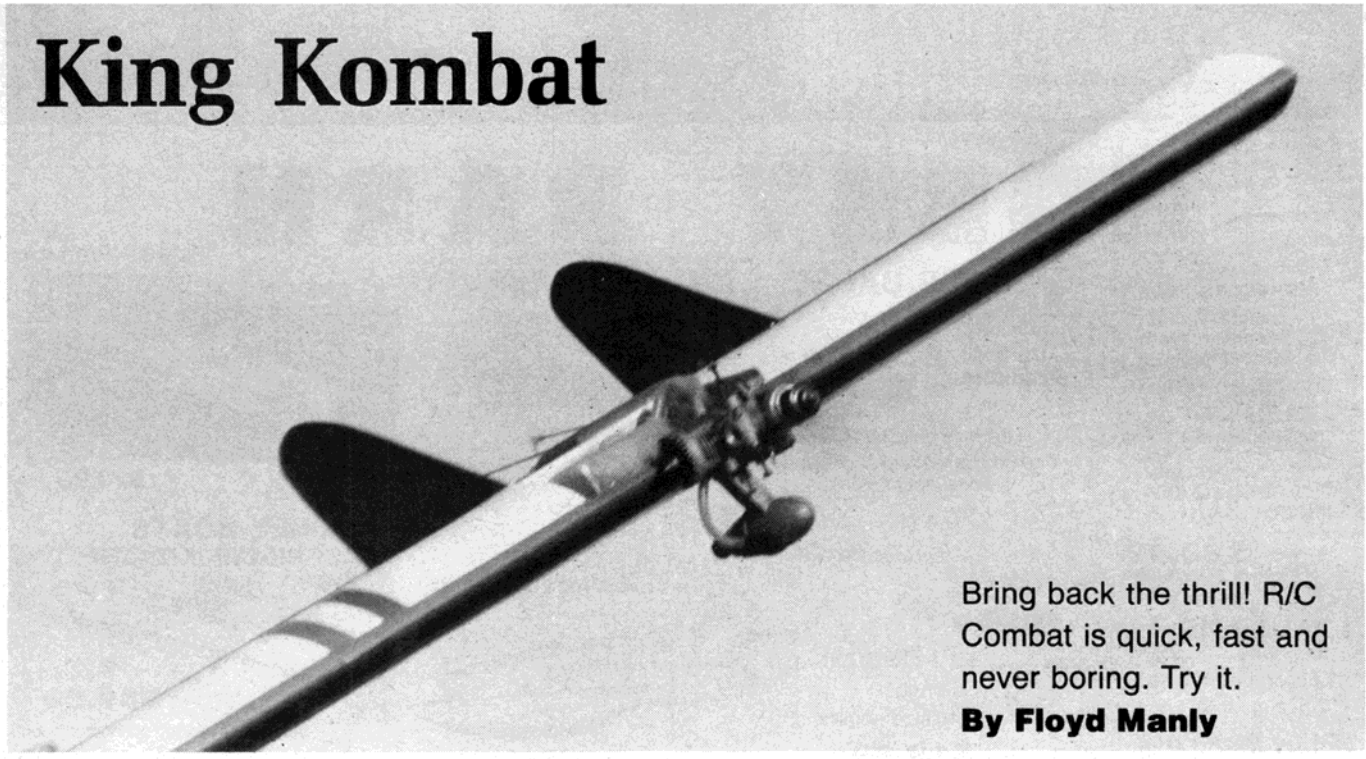
King Kombat



Bring back the thrill! R/C Combat is quick, fast and never boring. Try it.

By Floyd Manly

PHOTOGRAPHY: FLOYD MANLY

Got a case of the R/C blasé blues? The author's got a sure cure, the *King Kombat,* five dollars and ten hours from some exciting flying.

You say ya got a bad case of the "dulldrums"? Ya say R/C was exciting and a lot of fun—for a while—but lately the thrill has dimmed and unless something interesting comes along, maybe you'll hang it up for a while?

Well, we've got a sure cure for that bad case of the frumps! Radio controlled *Combat!*

Start right now, and by Sunday morning you'll have it all back. For about five bucks worth of balsa, and ten hours of your time, you'll have a handful of excitement that will pucker your piker, and get the ole knees knocking again. The *King Kombat* is the epitome of R/C flying. Quick, fast, and never, never boring!

The secret of *King Kombat's* ability to fly, *and* perform, is the elevon control. With the moveable servo tray shown on the plan, one servo operates the ailerons in normal fashion. The other servo is mounted in the tray but its arm is anchored to the airframe. Input of the elevator stick moves the tray *and* the other servo, which is linked to the control surfaces. Pull back on the stick, the tray slides forward, and both surfaces will come up for a loop. Hold full up, then move the stick to one side, the other servo wheel rotates, and one of the surfaces will drop to neutral for a roll. A typical tray is shown without dimensions because your servos may differ in size than the Futaba F-20s I used. Standard servos can also be used if the radio compartment is made longer to fit.

King Kombat's quickness comes from it's size and weight. A wing area of 414 square inches, toting a launch weight of only 28 ounces (That's right. One pound and 12 ounces) means it's in the dagger class of dangerous weapons. It doesn't take much to change directions, and if you're not careful you can bite your own tail off.

If you're wondering about the lack of landing gear, don't! When dead stick, which is the normal landing, the *King* slows down so much that you can ease him in for a one bump landing. It's possible to catch it in mid-air, it's moving so slowly. If you've lost the streamer, she's a little cleaner and faster, but still catchable.

The fin shape is strictly for reference. Any other shape that appeals could be used. Some *Kombats* have been flown with single fins, and a few with tip plates. Tip plates give a "Star Wars" look to a combat ship, but will also make it squirrelly if they're not perfectly parallel with the line of flight. Also, tip plates are susceptible to damage during the bump landings we make.

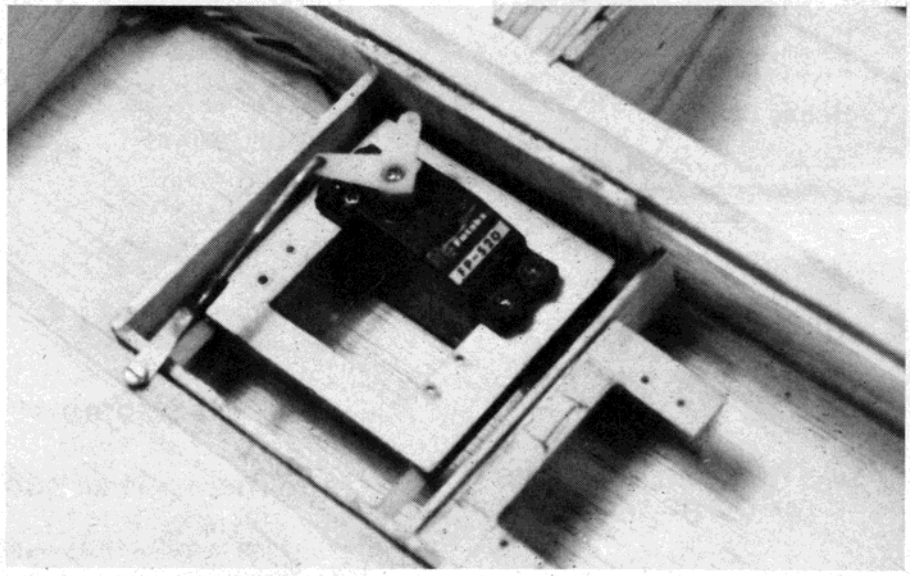
The fuel tank shown is a Sullivan four ounce slant. A two ounce could be fitted under the leading edge sheeting, but the tubing for the clunk is so doggone short that flame-outs happened too often. Even with the four ounces the tubing was too stiff. We replaced it with surgical rubber. On our version, the tank is held in place with a couple of dabs of silicone compound.

Another word of advice is to be sure the antenna is routed out to the wing tip. All you have to do is tangle it once in a spinning prop, and you'll know why it's out there.

If you get enough people interested in R/C Combat, one of you should build a jig to assemble replacement ships. With a jig and cyanoacrylate glues, you can fab up two or three in an evening. I've sold them for $15.00 to the guys that don't have the time or inclination to build.

Trim for flight

Set the elevons with about 3-4 degrees (slight) "up," so when it's handlaunched, you'll get a climb. It's better to have too much "lip," than not enough to keep the plane from diving when the controls are re-



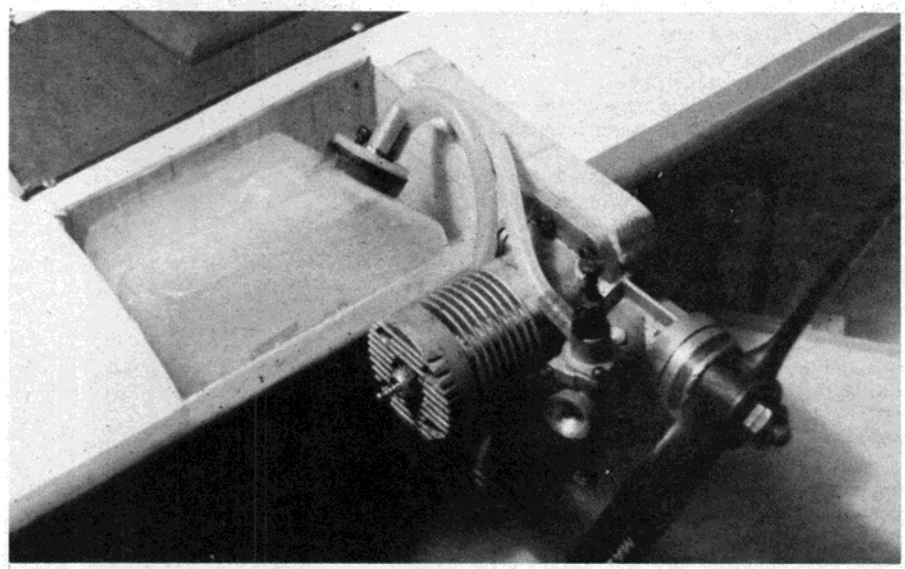
The elevon system shown here provides directional and pitch control. The elevator servo moves the entire servo tray while transmitting up and down movement indirectly through aileron servo.

leased. Check the CG, and stay on the nose heavy side, *or else!* Also check for a heavy tip before flying. Move the batteries or receiver around to get it right. A heavy tip will still fly, but will drop when you're dead-sticking in. Engine control should be set so the trim lever will shut the carb and kill the motor when you're ready to land. A mouse trap trigger to cut off the fuel could be designed to work with full "up" trim and full elevator. More important than mere control during the flight, is the capability of full motor cut-off in the event of an emergency.

Mid-air collisions are a distinct probability with combat, much more so than with any other form of R/C, with the exception of Pylon racing. Besides the danger of loss of limb or life, consider the effect on your radio and motor. The impact difference between a flutter down, and a full bore ripper could cost you dearly.

After you've built and flown one, you'll rush home to build two or three more, just so you won't have to wait for the glue to dry when you might need another one. Let me ease your concern a bit by saying that I have never had a mid-air, and have only seen *one!*

At first, you'll be flying up around pattern height, just happy that you're able to keep it in the air. A couple of flights later, you'll start to catch up and find out that you do have control of it after all. That's when you'll find yourself seeing more and more of the tree tops. Pretty soon you'll start seeing the grass while you're flying. Very soon after that you'll wish that you had those extras hanging back in the shop, because when you do a lot of flying at "one dumb" high, it takes only one dumb mistake to dork. With your second combat ship you'll wish you had three eyes. One to keep on your bird, one to watch the plane you're attacking, and a third to see if anybody is on your tail.

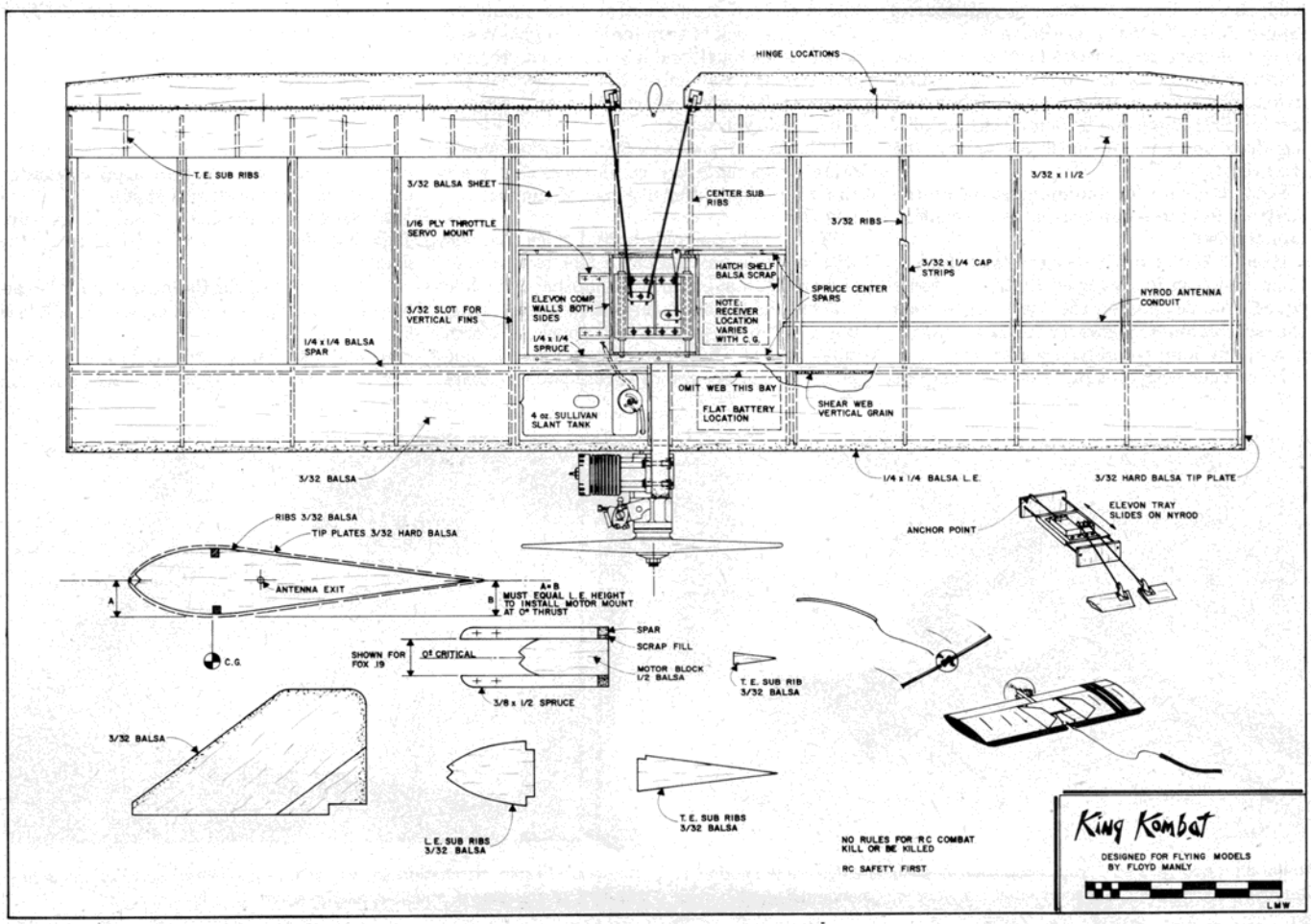


A Sullivan four ounce tank provides plenty of flight time. However, make sure the internal feed tube is flexible enough to withstand the "contortions". The author substituted surgical tube for the silicone.

Construction

The following is a suggested sequence of assembly to assure building a warp-free wing. Cyanoacrylate glue is used throughout, except step 15.

1. Pin down the bottom trailing edge sheet, bottom center sheet, and bottom leading edge sheet.
2. Glue the bottom spar to the leading edge sheet.
3. Glue the ribs to the trailing edge sheet, center sheet, and spar. Allow space for the vertical fins. *Do not* glue to the leading edge sheet yet.
4. Glue top spar to all ribs.
5. Glue top trailing edge sheet.
6. Glue sub-spars.



7. Glue shear webbing in all bays except the battery compartment.
8. Glue leading edge spar.
9. Glue bottom cap strips.
10. Unpin the trailing edge of the wing, and raise it to *exactly* the same level as the leading edge spar.
11. Assemble the motor mount beams, center spacer, and center leading edge ribs, then glue to the spars only.
12. Cut the bottom leading edge sheet to clear the motor beams, then brush water on the outside surface of the leading edge sheet.
13. Re-pin down the trailing edge, then curl the leading edge sheets up to meet the ribs and leading edge spar. Clamp, check for warps, then glue.
14. Cut the top leading edge sheets to clear the motor beams, then glue to top spar.
15. Wet the outside surface of the sheets, apply standard wood glue to all ribs and leading edge spar, then curl the sheets down and pin to the leading edge spar.
16. Glue top cap strips, allowing space for the vertical fins.
17. Glue tip plates.
18. Cut through the top leading edge sheet for the tank compartment.
19. Epoxy *and pin* the hinges into the trailing edge sheets.
20. Install your covering before installing the fins, and resin coating the motor mount and tank compartment.
21. Install servo tray, and all electrics. Locate the battery and receiver to obtain the CG at the spar.

Flying

Two precautions should be, nay, *must* be mentioned before you chuck the *King* up for a test hop. The most important is to expect wild, almost violent, reactions to your control inputs. A way to tone these down is to attach 30 feet of crepe paper ribbon to the tow line. During contests we use 15 feet of two pound nylon fishing leader and 15 feet of ribbon, but for that first flight you'll want all the stabilizing drag you can get until you've got the trim right.

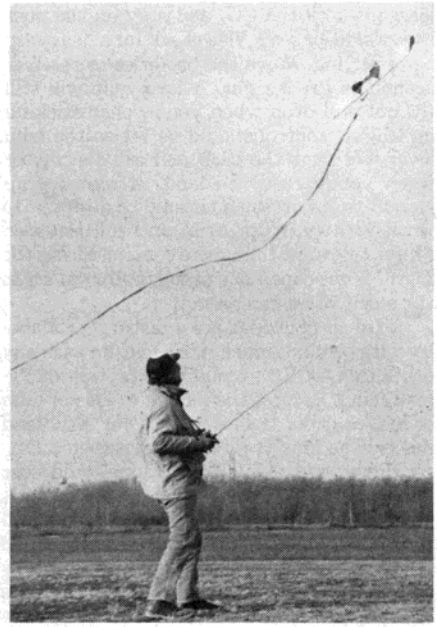
Second: set up for minimum throw on the controls for the same reason as precaution number one.

Ready? You've made sure the tank clunk is floppy enough for inverted flight and knife edges? You've checked the controls? Turned the receiver *and* transmitter on? Don't laugh, it won't be long before you waste one.

Have your assistant pull the streamer out in front where he won't step on it. Then, grasping the wing with one hand between the elevons, and the other out on a tip, *push* the *King* out at waist level. No running and throwing, just stand and push out at the tree tops across the field. This is strongly advised because the grip for an overhead launch tends to flip the wing over on it's back, and she'll come right back at you. You'll be able to launch yourself, one handed, by next week. Trim for launch is usually with two or three clicks of "up" from neutral. This should be within one click of trim for level flight. When it leaves his hand, and if you feel a correction is necessary, remember that it reacts *right now,* so be ready to counter any control movement you input.

It'll take four or five flights before you'll start developing any confidence, and start thinking about offensive moves against opponents.

We fly with no-holds-barred rules. Launch with a minimum tail of 15 feet tow and 15 ribbon, and have at it! Cut another tail while you still have your's earns five points. Making a cut after you've lost your's is worth three points. Just entering a joust is one point. Of course, you can score your contests by any system that suits your club. A points log, with prominently posted standings, generates a lot of interest among non-combatants, and may convince a couple more to join in the fray and fracas.



Launch is a simple but critical affair and can be easily accomplished by the pilot alone. Grasp the model between the elevons and push out. Don't run or launch overhand. It can upset the model.

Tactics

Helpful hints to sudden success. 1. Get up early. This gives you a few moments to get trimmed and set. It also gives you the altitude and speed to make a kill on the other planes climbing up, and might give you first shot at a slowpoke. A kill is a kill!

2. Have a partner watch the other planes and pick out a rookie. A kill is a kill!

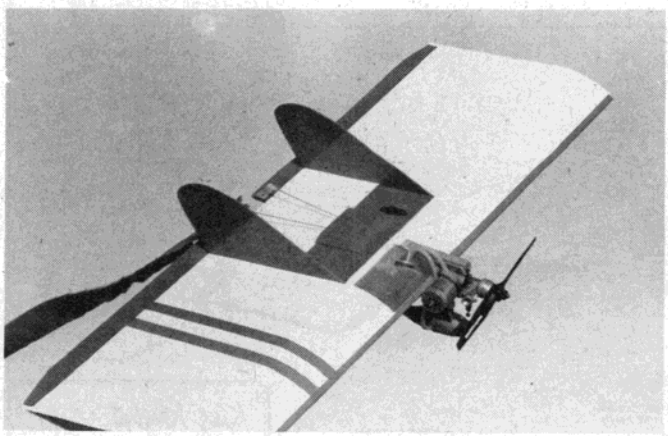
3. Forget about defense. Be on the offense all the time.

4. Once you pick an opponent, hound him until you've got the kill. Don't wander around looking for chance shots.

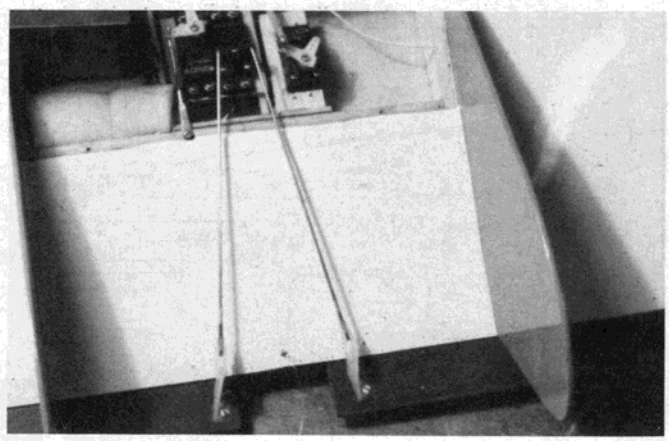
5. Get as low as possible and "shoot" up. This discourages opponents from diving on your tail.

6. At the end of the flight, watch for "dead sticks" coasting in. He's helpless. A kill is a kill.

It takes nerve and verve to fly R/C combat. The *King Kombat* is a winner! Are you?



No landing gear you say? Well, dead stick, floating landings are the norm for the *King Kombat.* Fin shape is optional. Let your imagination go!



Completed radio installation shows servo arrangement. Servo on left is the elevator servo; servo in middle is aileron servo. Throttle's at right.