GEORGIA CRACKER

62" span low-wing design for .19 to .35, single through six channel.

By WALT MITCHELL

IF you've built every kit on the shelf of your local hobby shop and are beginning to repeat yourself, the "GEORGIA CRACKER" will make an excellent change of pace. Also, cutting out your own formers, ribs, etc., from good-grained, warp-free Sig balsa will be a pleasure if you've had the same experience I have with some die-cut kits where apparently the job was done with mom's cookie cutter.

The CRACKER is a BIG airplane (span 62"), probably approaching the outer limits in size for single channel. But it has excellent flight characteristics and is very stable and forgiving of pilot error. With some wing modifications and a bigger engine, it could be made into a hairy multi job for the pros. Me, I like things calm and peaceful-like, as I am what they call a "white-knuckle" flyer.

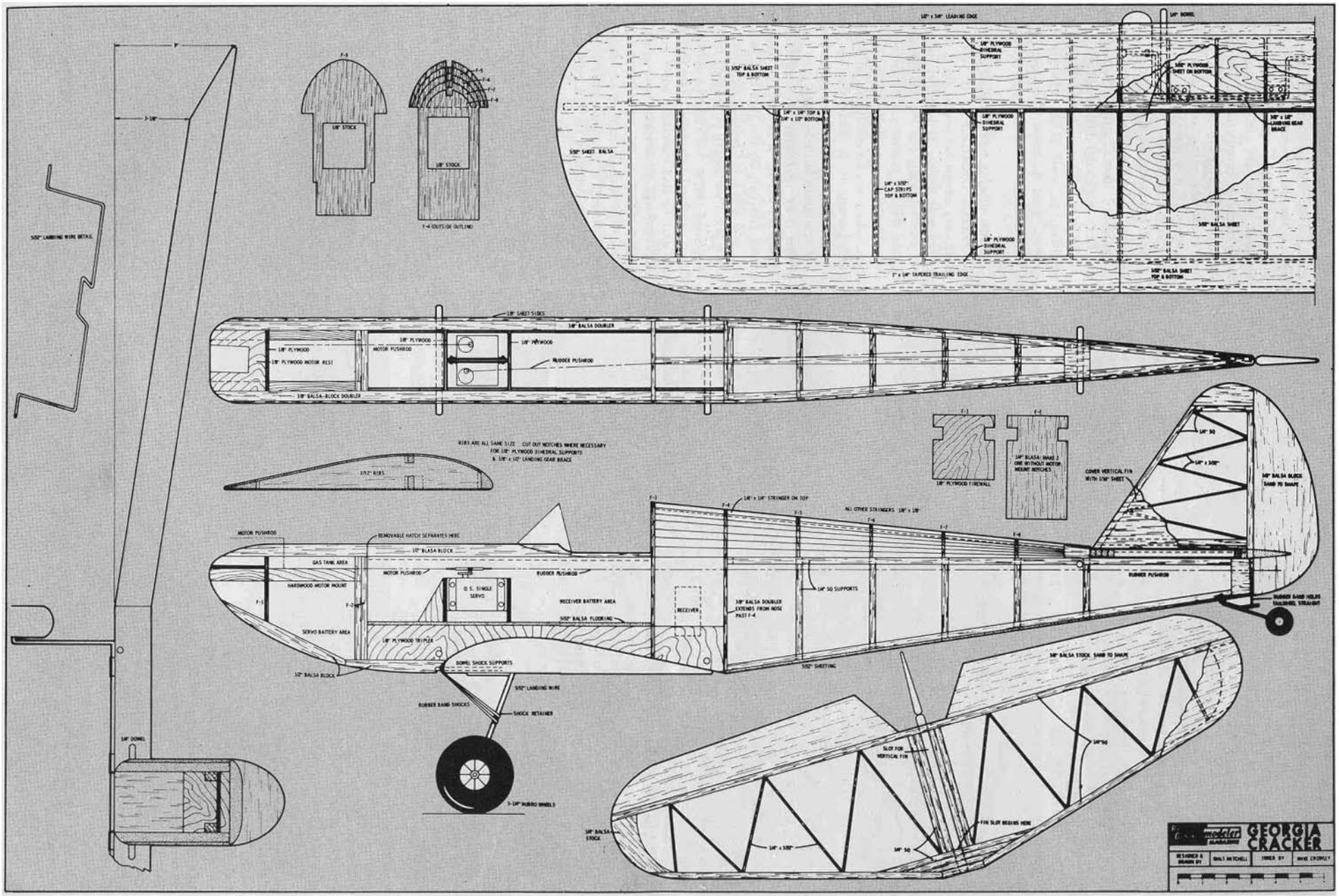
I would like to report that the CRACKER flew right off the drawing board like Lou Perretti's Gulf-Hawk (RCM, April 1966), but a funny thing happened on the way to the Hall of Fame. . . .

We decided on a hand launch for the first flight because the terrain was somewhat uneven. The Max 19 fired up cooperatively and my friend and trusted flying companion, Bill Bell, took off across the field as fast as his little bandy legs would carry him, brandishing the CRACKER like a fat javelin. Now Bill had never hand-launched a low-wing plane, especially one this big, and he failed to accurately compute the distance between the top of his head and the wing.

As a result, when he made the throw, his hat caught neatly on the left leading edge and the CRACKER took to the air as probably the first airplane in history to wear a white 6⅞ Spinnaker hat.

Bill's lid was firmly lodged, and the big ship proscribed a quick arc to the ground, picking up a complete venturi load of gritty red Georgia clay. No serious damage, though, and soon the intrepid aviators are at it again, this time attempting an R.O.G.

With only a 19 (it really should have at least a 25) up front, the CRACKER is definitely not suited for carrier operation. Tail high, she rolled across the field . . . and rolled and rolled and rolled. Power lines loomed, and I kept having flash backs of Jimmy Stewart trying to coax the overloaded Spirit of St. Louis off that muddy runway. Finally, however, she broke ground, gained altitude rapidly, and I was off on a most gratifying flight. Smooth, sweeping turns (a little too smooth — had to add some area to the rudder), lazy 8's, some general field circling, and a bounce-free, perfect landing, dead stick.


1/2" x 3/4" LEADING EDGE
1/4" DOWEL
1/8" PLYWOOD DIHEDRAL SUPPORT
1/32" BALSA SHEET TOP & BOTTOM
1/16" PLYWOOD SHEET ON BOTTOM
1/4" x 1/4" TOP & 1/4" x 1/2" BOTTOM
1/32" SHEET BALSA
1/4" x 1/2" LANDING GEAR BRACE
1/4" x 3/32" CAP STRIPS TOP & BOTTOM
3/32" BALSA SHEET
1" x 1/4" TAPERED TRAILING EDGE
3/32" BALSA SHEET TOP & BOTTOM
1/32" LANDING WIRE DETAIL
1/8" STOCK
F-4 (OUTSIDE OUTLINE)
1/8" SHEET SIDES
3/4" BALSA DOUBLER
1/8" PLYWOOD MOTOR REST
1/8" PLYWOOD MOTOR PUSHROD
1/8" PLYWOOD RUDDER PUSHROD
3/8" BALSA-BLOCK DOUBLER
RIBS ARE ALL SAME SIZE. CUT OUT NOTCHES WHERE NECESSARY FOR 1/8" PLYWOOD DIHEDRAL SUPPORTS & 3/8" x 1/2" LANDING GEAR BRACE
1/32" RIBS
1/8" PLYWOOD FIREWALL
3/4" BALSA! MAKE 2 ONE WITHOUT MOTOR MOUNT NOTCHES
COVER VERTICAL FIN WITH 1/16" SHEET
1/4" SQ
1/4" x 3/8"
3/8" BALSA BLOCK SAND TO SHAPE
1/4" x 1/4" STRINGER ON TOP
ALL OTHER STRINGERS 1/8" x 1/8"
MOTOR PUSHROD
REMOVABLE HATCH SEPARATES HERE
1/2" BALSA BLOCK
GAS TANK AREA
HARDWOOD MOTOR MOUNT
MOTOR PUSHROD
RUDDER PUSHROD
O.S. SINGLE SERVO
RECEIVER BATTERY AREA
RECEIVER
3/8" BALSA DOUBLER EXTENDS FROM NOSE PAST F-4
1/4" SQ SUPPORTS
1/32" BALSA FLOORING
RUBBER PUSHROD
RUBBER BAND HOLDS TAILWHEEL STRAIGHT
SERVO BATTERY AREA
1/8" PLYWOOD TRIPLER
1/2" BALSA BLOCK
DOWEL SHOCK SUPPORTS
1/32" SHEETING
1/32" LANDING WIRE
RUBBER BAND SHOCKS
SHOCK RETAINER
1/4" DOWEL
3-1/4" RUBBO WHEELS
3/8" BALSA STOCK SAND TO SHAPE
SLOT FOR VERTICAL FIN
1/4"SQ
FIN SLOT BEGINS HERE
1/4" x 3/8"
1/4" SQ
1/8" BALSA STOCK
GEORGIA CRACKER
DESIGNED & DRAWN BY
WALT MITCHELL
TIMED BY
MIKE CROWLEY

Designing and building your own airplane and then having it fly perfectly gives you a goody feeling that beats sex, night baseball, and all those other funny things. The apogee was reached when a guy who had driven up during the flight made me remove the hatch to prove that the CRACKER didn't have proportional multi controls. For this, in gratitude, I had my wife kiss him heavily about the head and shoulders . . . one good turn deserves another.

Construction

The GEORGIA CRACKER is designed to carry the matched OS rudder and motor servos. These servos (or perhaps the Royal single servos) are necessary in a single channel airplane the size of the GC, as an escapement will not adequately handle the air load on the rudder.

In my opinion, servo operation is much preferable to escapement (more dependable, no rubber lands, push rods instead of torque rods, etc.). The only gripe I have with the OS servos is that the motor control continues to cycle as long as it is receiving a signal. It must be keyed just **so** to get the desired throttle position . . . takes a lot of practice to perfect the blip and it remains an art, rather than a science, to get high, low or medium. I understand Royal has licked this problem with their single channel servos, but check it out before you purchase.

Those of you who are experts may be tempted to alter the design of the CRACKER . . . less wing and stab area, etc. If you know what you are doing, be my guest. If not, my advice is don't mess with it. She flies fine just like she is and the semi-scale appearance will be a conversation piece at any field. My wife, who was a World War II fighter pilot, says it looks like a combination Ryan, Mustang, and ME 109. She also suggested that I might use my time at some more profitable endeavor than designing toy airplanes. For this I sent her screaming from the house with great running welts on her head. Before he masters radio control, the wise modeler will have also mastered WIFE control. I recommend to RCM an article on this subject. I volunteer to write it.

Construction of the CRACKER is simple and straightforward. The wing is standard in every sense, with flat bottomed airfoil, planking along leading and trailing edges and cap strips on the ribs. The center section is stressed to take the shock of landing. It is advisable to cover the top of the center section with Celastic to prevent damage during rough landings and to avoid rib crush, if the wing is wiped off in a crash. I also fiberglassed the leading edge from tip to tip which proved invaluable during one landing in which I attempted to bisect a fence post. Note that certain sections of the bottom of the center section are 3/32" plywood to protect against the fold-back action of the landing gear.

Because it is stressed directly on the wing, the landing gear itself is designed to absorb as much of the shock of landing as possible. Note that it is hinged to hardwood motor mount stock which parallels the main spar. Rubber bands hold the gear forward in place and these bands dissipate most of the energy in rough landings.

You may have trouble, as I did, in bending the 5/32" landing wire to the prescribed shape, but it's worth the effort. Heating with a butane torch before each bend helps a lot . . . and what are a few second degree wire burns to the truly dedicated modeler?

Although it may not look it, the fuselage is of simple box construction. The huge 3/8" doublers that run from the nose past former F-4 add weight, but they make for a real hard-nosed airplane, especially when the entire nose is fiberglassed from the leading edge forward . . . good insurance for ham-handed model airplane drivers.

Cut out the fuselage side slabs from 1/8" sheet, using the heavy black lines on the plan as guides. You probably won't be able to get balsa stock long enough to do the job without splicing. Make the splice 36" from the tail which will allow the big 3/8" doublers to secure the splice. The doublers are cut to the same shape as the 1/8" slabs and extend to the rear of F-4.

Glue F-1, F-2, F-3 and F-4 in place. This forms the "box" area of the fuselage. Bring the side slabs together at the tail and glue tail block in position, making certain of symmetrical alignment. Add 1/4" sq. longerons, supports and cross braces. Position F-5, F-6, F-7 and F-8 on top of 1/4" sq. cross braces and then add stringers. Note that the top 1/4" sq. stringer fits into notches in formers, but that 1/8" sq. stringers rest on top of formers. This allows stringers to show when covered. Use as many stringers as you wish; I put them 1/4" apart at F-3, sweeping them into a solid mass at the rear.

The tail wheel swivels and was originally hooked in to move left and right with the rudder. It didn't get enough throw from the rudder, however, and I found it best to let it swing free, secured only by a small rubber band.

The vertical fin and stabilizer are both of the same construction, utilizing 1/4" sq. frames, cross braced geodetically, with 1/4" x 1/8" ribbing and covered entirely with 1/16" sheet. The rudder and elevator are cut from 3/8" stock and sanded to symmetrical airfoil shape. This is extremely strong construction, and it is not necessary to silk these assemblies over.

Although I am only a poor single channel boy (who can afford multi except Doctors, Lawyers and Don Dewey . . . the manufacturers GIVE Dewey his equipment) I am certain that the GC will adapt very nicely to either bang-bang multi or proportional. To add ailerons would require beginning the dihedral at the wing root and perhaps changing to a symmetrical airfoil . . . not much more.

And I would like to see some of the multi boys I know build something that doesn't look like Taurus or Son of Taurus. I cry out in the darkness for CHARACTER in R/C models. Modeling is an aesthetic as well as an electronic endeavor, and I hope the GEORGIA CRACKER is a candle lit in this direction.

A few closing words about flying the GEORGIA CRACKER: If you've got room, say about 60 yards, let it R.O.G. on the test flight. It handles nicely on the ground and can be taxied by the skillful button pusher on medium throttle. There is no tendency to ground loop, and you can abort the take-off any time before it is airborne by giving hard rudder with no damage done.

If you hand launch, **keep your hat out of the way** and don't be timid about THROWING it. It is a heavy load, and unless you can do the hundred in about 9.5, you can't get proper airspeed without a good whipping motion of the arm. Point the nose UPWARD when you throw, about 20 degrees. The GC won't stall out (it has excellent wind penetration) and will go upstairs with gratifying swiftness.

A touch and go can be accomplished at low throttle if you start your approach far enough out and IF you can key for full motor before the tail settles. The springing motion of the landing gear can accommodate reasonable variation in the terrain without digging in.

The way the GC built out for me, it required absolutely NO DOWN THRUST, which may be a characteristic of low wing planes. Do your adjusting with shims under the trailing edge of the stab. My GEORGIA CRACKER wears a permanent 3/32" shim under the tail.

Because of the size of the airplane, more rudder area is necessary than was originally planned. This additional area is included in the drawings published herewith. A tab was added to the prototype, which can be seen in the photos.

A word about the OS servos: The rudder and motor servos insist on absolutely separate power, the rudder servo taking 4.5 volts and the motor servo requiring 1.5 volts.

Okay . . . she's all yours. Build it light, fly it right and I guarantee the GEORGIA CRACKER. If you like it (how could you help) write and tell Don Dewey. One pat on the back from a reader of RCM will give me the ultimate goody shiver.

GEORGIA CRACKER

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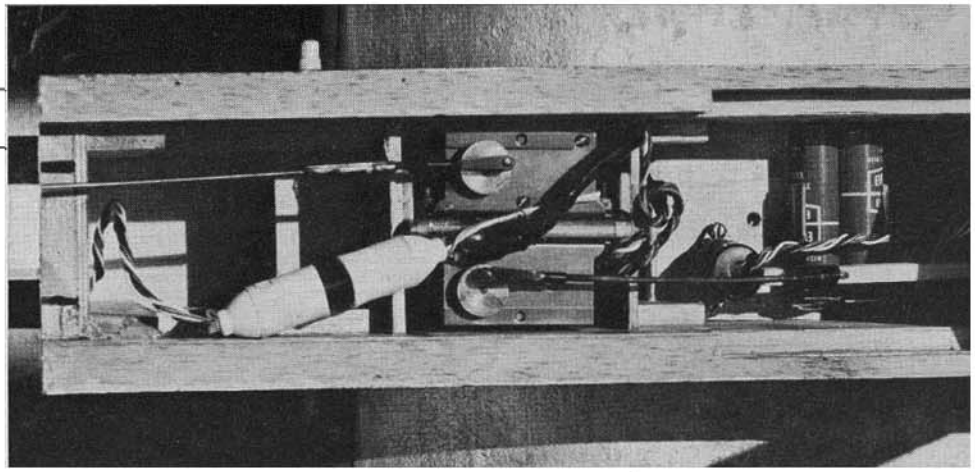

Upper right: Hatch-off view shows OS servos installed. Nicad pack is forward out of view. Radio is to the rear, also out of sight.
Right: Bill Bell, co-pilot of the GC, models size 6⅞ Spinnaker hat which proved to be the CRACKER's undoing on its maiden voyage. Note Bell's sheepish grin!
Below Right: GEORGIA CRACKER gets a snoot full, as author sweats out count-down. AMA numbers mean nothing. Note additional rudder tab which was necessary on prototype.
Below: Author demonstrates shock absorbent characteristics of landing gear which enables CRACKER to deal with rough terrain without a tricycle LG.