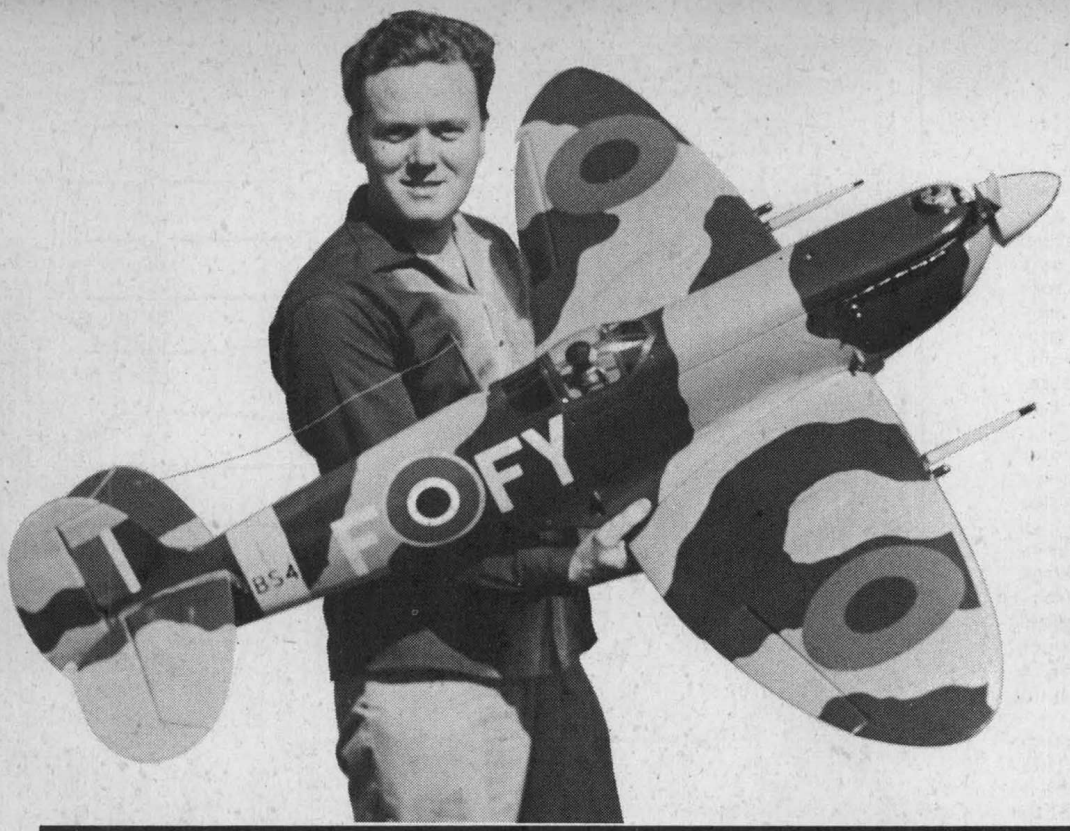


How to Build George Harris' Magnificent Radio Controlled SPITFIRE

■ One of the most beautiful aircraft ever built, with all-elliptical surfaces, was the Supermarine Spitfire. Designer was R. J. Mitchell who was also responsible for a series of racing seaplanes which included every British winner of the Schneider Trophy races from 1918 to the end of the contests—which resulted in the outright winning of the trophy for Britain.

The prototype Spitfire which first flew on March 5, 1936 was an outstanding success, but Mitchell died in 1937 before his creation began the job for which it was designed. During the Battle of Britain, the Spitfire—together with the Hurricane and greatly outnumbered—smashed the Luftwaffe and ruined Hitler's invasion plans. While various modifications greatly improved the Spitfire, the Focke Wulf 190 appearing in late 1941 was a serious threat. In answer to this menace a much improved Rolls-Royce Merlin engine was fitted to a strengthened airframe to give the Spitfire IX. The most obvious changes in the Mark 9 were the lengthened nose, large "flat-top" cowling and equal size radiators under each wing.

This aircraft had a top speed of 408 mph at 25,000 feet and a rate of climb that was most upsetting to the enemy. The Spitfire was the only Allied aircraft to remain in production throughout the war. The last one built was an F.24 delivered in February 1948. Final operational flights by Spitfires were in mid-1957.

Since scale modelers are a demanding bunch, the markings have been kept authentic and several different aircraft squadron designations have been given as alternatives. The camouflage scheme and R.A.F. markings are as applied during the appropriate period.

Originally a 70 inch span Spit built as a test bed for this type of model flew with a Fox .59, followed by a McCoy 60. This model has made almost 100 flights and, despite its heavy weight of 10-lbs, is very aerobatic, even in a glide. A second, smaller model to accurate scale with full war paint proved to be even more aerobatic. So far the second, shown in the photographs, has made 113 flights. It is momentarily retired after the right landing gear leg snapped off at the bend while landing across a deep rut.

Test pilot for the project was Ed Fitzgibbon of the San Diego Drones R/C club, who went through all the usual tricks plus a few unusual ones. Most of the flying was with a Super Tigre .56—but a .45 will be plenty when the structure is lightened as shown in the plans. When modified Hassad .65 was installed the Spit just spiraled itself up into the clouds.

STRUCTURE. The model is not intended for beginners, so details like control systems and equipment installations have been skipped. Most experienced modelers have their own ideas about such things anyhow and their equipment varies considerably.

The fuselage is built upside-down on the crutch directly on the bottom view, the basic structure completed to a considerable degree before removal. This ensures a true alignment which is essential in a large, fast model. The ply sides key into the formers and the separate side pieces lock the whole assembly together. The rear formers are held erect by the bottom longeron, the main part of the planking being easily applied in this position.

This structure is now removed from the board and the upper section added. Note that the fin fairs smoothly into the rear fuselage with no definite break. The tailplane installed at this point rests atop the crutch.

Tail construction is simple, the tailplane being covered with 1/16" sheet and the elevators silked. On the original model the tail assembly, separate and held by rubber bands, has never been removed since the first flight, so the drawings show it all in one lump with the fuselage. This arrangement is lighter and if a crash is hard enough to knock the tail loose, your repairs are going to be extensive anyway. The tailwheel hook-up should be made before completing planking; don't use anything less than 3/32" wire for the tailwheel strut. Keep the tail light and beef up the nose to eliminate later ballast. The 1/8" planking on the fuselage may seem a little heavy, but there is not too much inner structure and sanding will reduce it some.

A covering of fiberglass on the nose back to the wing will help a lot in rough landings. Details such as the reflector gunsight and rear view mirror help a lot toward realism and don't require much

Real Spit Mark 9 flies with beer barrel under each wing to landing strip on Normandy beachhead soon after D-Day.

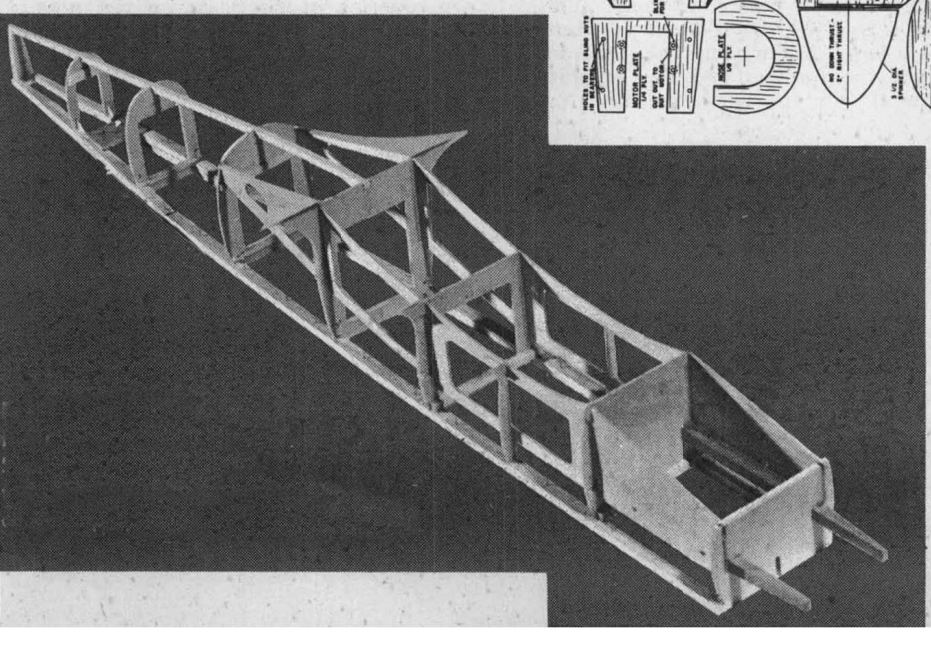
time to make. The instrument panel layout is shown, but accurate dials are a bit impractical in this size, except to the real fanatic who will probably have access to photographs of the things anyway. Cockpit framing is cut from green plastic or cloth tape and seems to stay on very well in use. The large wing root fillets are no problem if made from narrow strips; the thin ply platform provides a very firm support for the wing. If 1/32" ply is not available in the required size, hard 1/16" balsa can be used with the grain across the fuselage.

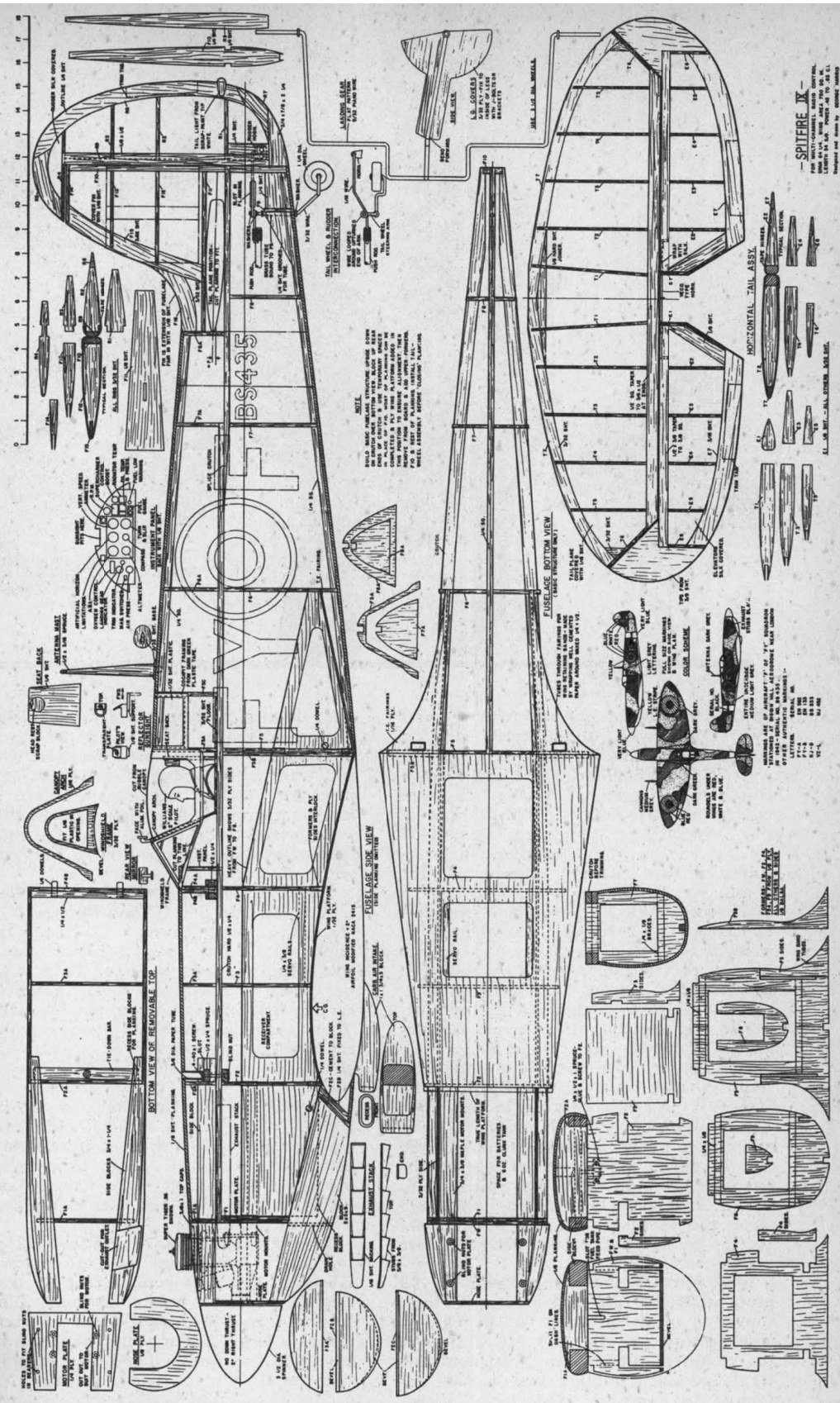
Up at the front end the ply motor plate allows installation of different motors without carving on the motor mounts. Cut the removable top cowl to fit around your particular motor, have an ample cut-out for exhaust. A large spinner as shown may be a slight problem but it can be made from fiberglass or compounded from a small spinner with a built-up back section. The one in the photos is custom made hand-spun aluminum.

Wings are best built with the bottom main spars flat on the plans, the other members packed up with scrap to proper height. Laminated leading edges simplify curvature and are very strong. Covering the wings completely with sheet balsa adds very little to the weight and increases strength tremendously, in addition to giving an appearance of metal covering. The only fabric covered surfaces on the Spit are the rudder and elevators, so that's the way our model is built. Both wings are joined and the landing gear and aileron controls installed before sheeting. Ailerons and associated shroud inner surfaces are best painted before assembly for neat appearance. Aileron hinges in scale position are very strong and smooth in operation. Use good strong brackets or many J-bolts to hold the landing gear on the ¼" ply spar joiner.

Wing radiators are realistic with insect screen inserts to simulate cores, the insides between the screen pieces being painted black. The screen material offers little drag and, for a gimmick, a toy whistle can be concealed in one to give a Merlin whine in flight. The tubes through the wing fillets provide a neat solution for the rubber retaining bands without any strain on the fillets.

Cannons built around aluminum tubes are held on by short dowel plugs which





are easily replaced if knocked off in a crash. The Spitfire IX had a "universal" wing which could carry four 20mm cannons or two cannons and four .303 machine guns—most had the latter with two cannon ports blanked off.

FINISHING. Considering the stresses involved in violent aerobatics it is advisable to hold everything together with silk covering all over, filled and doped to a smooth consistency. The basic color of the Spitfire is gray and the true color is closely matched by Fuller's Butyrate Dope, Aircraft Gray for the under surfaces. Dark gray for the top surface is obtained by mixing about one part black

SPITFIRE IX LIST OF MATERIALS

SHEET BALSA: 4 sheets, 3/32 x 4 x 36 for Wing & tail ribs, trailing edges; (14) 1/16 x 4 x 36 for Wing & tail sheeting; (6) 1/8 x 4 x 36 for Fuselage formers & planking, wing L.E.; 3/16 x 3 x 36 for Elevator T.E., wing ribs; 1/4 x 4 x 36 for Wing rear spars, fin spars, rudder outline; 3/8 x 3 x 36 for Wing radiators, cannon blisters; 1/2 x 3 x 36 for Wing radiators; 3/4 x 4 x 24 for Top cowl sides, nose sides, wing tips, rudder base block.

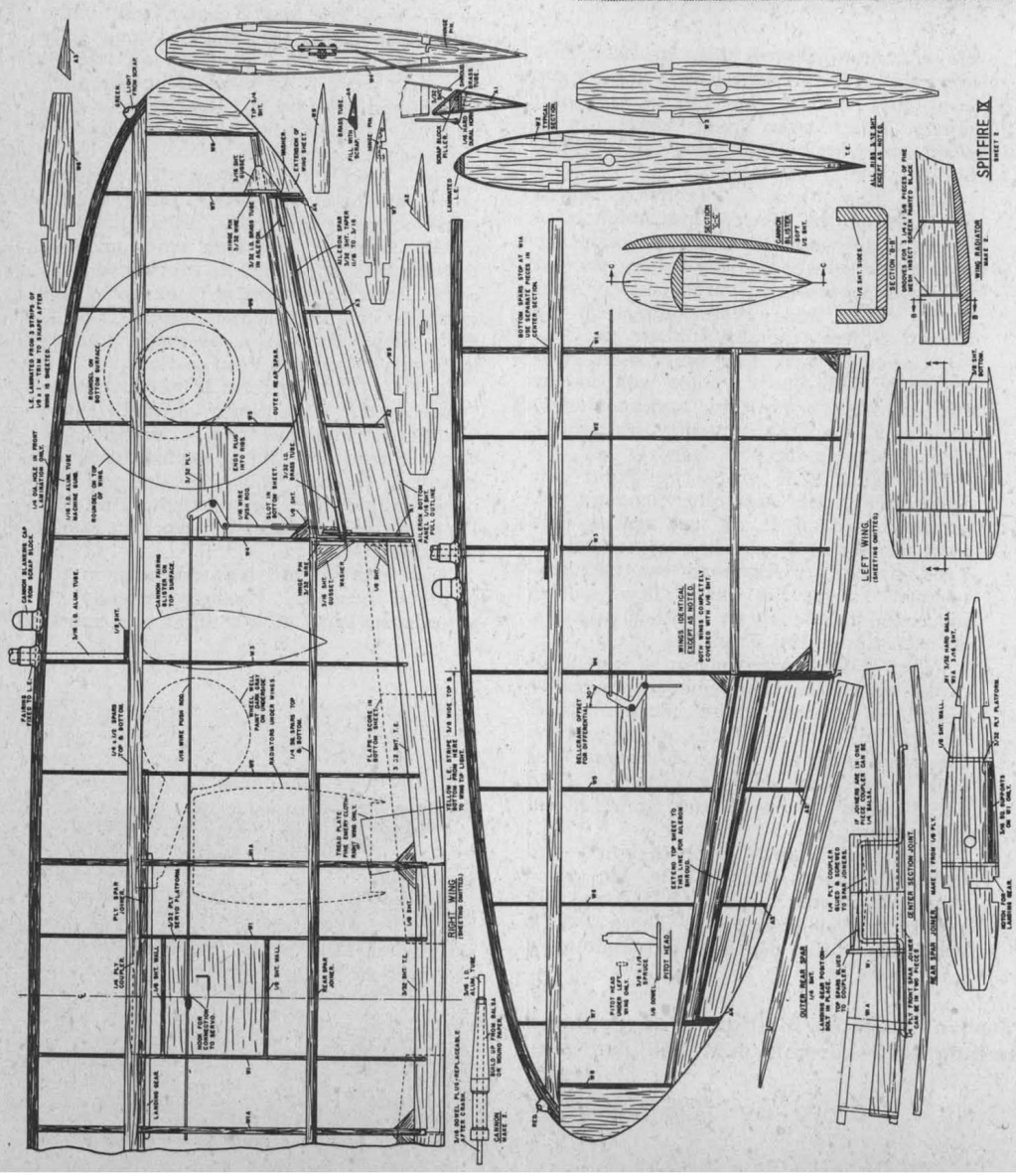
STRIP BALSA: 2 pieces 1/2 sq. for Tailplane spars; (7) 1/2 x 1/4 for Crutch, wing spars; (4) 1/4 sq. for Wing rear spars, fuselage longerons.

BLOCK BALSA: 1 piece, 2 x 5 x 9 for Lower nose block; 1-3/4 x 1 x 5 for Carb. air intake.

HARDWOOD: 1 piece, 10 x 15 x 1/32 ply for Wing platform; 4 x 12 x 1/16 ply for T.E. fairing, canopy arch; 12 x 30 x 3/32 ply for Fuselage box frames, windshield frame; 12 x 16 x 1/8 ply for Formers, rear spar joiners; 4 x 16 x 1/4 ply for Main spar joiners, motor plate; 3/4 x 3/8 x 24 maple for Motor mounts; 3/8 x 1/4 x 12 spruce for Servo rails; 1/4 dowel x 15 for Wing & top cowl retaining dowels.

PIANO WIRE: 2 pieces, 1/16 dia. x 36 for Aileron & rudder linkage; 3/32 dia. x 18 for Aileron hinges, tail wheel strut; 5/32 dia. x 36 for Landing gear.

MISC.: 1 pair 3 1/2 dia. wheels; 1-1/4 dia. wheel; 3/32 I.D. x 12 brass tube for aileron & tail wheel hinges; 3/16 I.D. x 20 alum. tube for cannons. Elevator horn, hinges, push rods, pilot head, canopy, plastic for windows, green plastic tape, spruce for antenna & pitot head, landing gear brackets, nuts & bolts.



to five parts of the gray. Incidentally, Aero-Gloss mixes very well with Fuller's dope which comes in quart cans, one being ample for the Spit. Aero-Gloss Stinson Green is the camouflage green, the red, white, blue and yellow being standard insignia colors. The light gray letters on the fuselage are of the basic gray with a little white added and the spinner and rear fuselage band are a very light blue made by adding just a touch of blue to white dope.

CONTROLS AND FLYING. My original model used Bonner servos and Orbit radio, but the space available is ample for all the popular equipment. If you use Space Control an opening should be cut in F3 and the servo rails extended from F2 to F5 to carry the mounting platform. The receiver can then be adjusted fore and aft for balance. Control movements need not be excessive . . . the surface areas are large and the plane is very responsive.

In flight the Spitfire is very stable but snaps through maneuvers and will tie knots in itself if you can operate transmitter switches fast enough. There is no tendency to fall off in tight banks; inverted flight is a cinch. Glide characteristics are good and stalling speed low, although the Spit should be flown into a landing rather than just dropped and flopped. Even with that narrow track landing gear ground looping is not a problem.

Watching the Spitfire in the air brings back nostalgic memories to those of us who saw the real thing in action . . . the war paint and little details being very convincing. About the only requirement for complete realism would be a retracting landing gear—this is planned for a near future project.