Building instructions

Grumman F7 F-3
Tigercat

Electric RC model
Order No. 1349/00

Specification:

Wingspan	approx.	1330 mm
Length	approx.	1063 mm
Wing area	approx.	27.5 dm²
Tailplane area	approx.	6.6 dm²
Total surface area	approx.	34.1 dm²
All-up weight with 10 cells	approx.	1950 g
Total surface area loading at 1950 g take-off weight	approx.	57.2 g/dm²
Wing loading (wing only)	approx.	70.9 g/dm²

RC functions: ailerons, elevator, rudder, motor speed

Replacement parts:

GRP fuselage	Order No. 1349/02
GRP nacelles	Order No. 1349/03
Pair wing panels	Order No. 1349/05
Tailplane	Order No. 1349/09
Canopy	Order No. 1349/04

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Power system for 10 cells:

Race 400-6.0 V with 2.33 - 2.64 : 1 gearbox	Order No. 7121/05 or 7121/06
With 21.5 x 15 cm / 8.5 x 6" propellers	Order No. 7228/28 or 7229/28
Propeller adaptor for 4 mm Ø shaft	Order No. 7124/14

Power system for 8 to 10 cells:

Permax 400 BB, Kyosho AP 29BB ("480" class)	
With propeller adaptor	Order No. 7120.90
Motor mount "M"	Order No. 7120/94
Gearbox housing	Order No. 7120/98
Gear set, 3.0:1, pinion with 3.17 mm bore	Order No. 7121/79
Ballrace	Order No. 7821/41 and 7822/40
With 21.5 x 15 cm / 8.5 x 6" propeller	Order No. 7228/28 or 7229/28
Propeller adaptor for 4 mm Ø shaft	Order No. 7124/14

The motors must be adjusted (re-timed) for left-hand rotation as described in the gearbox operating instructions, and some motors must be run-in before use. 480-size motors must not be re-timed by more than 7 mm, otherwise the rear bearing plate may fall off! The ideal rotational speed for a safe hand-launch is around 8400 rpm (with a freshly charged battery). The propellers must be balanced as accurately as possible, but before you do this it is important to check the true-running of the propeller adaptors, and correct with the socket-head grubscrews if necessary. Check that the blade tips spin in the same plane. The best way of correcting any discrepancy is by rotating the propeller relative to the propeller adaptor, working in small increments.
For running-in, and for setting up the motors for synchronous running, we recommend installing the motors on a "T" mount made of solid wood rails. This is not necessary with brushless motors.
If you are using 480-size motors, we recommend that you adopt the method of motor control which involves the throttle channel trim. This is described in the "Flying" section, and is applicable for both cell counts.

Brushless power system: direct-drive motors

actro C-6, see section N-N	Order No. 7002/36
Motor mount "M"	Order No. 7120/95
Propeller adaptor for 5 mm Ø shaft	Order No. 7124/15
With 21.5 x 15 cm / 8.5 x 6" propeller	Order No. 7228/28 or 7229/28
Recommended battery: 8-10 cells, NMH 300	Order No. 7443/60
Or Sanyo 2000 RC / 2400	

Motors with nose bulkhead mounting: see section N-N

Motor mount "M"	Order No. 7120/95

To ensure that the speed control system works reliably with brushless motors, each motor needs its own controller. Caution: you must not activate two BEC systems! Switch on the BEC on one of the controllers, and fix the second BEC switch in the OFF position! Naturally the brake must be switched off. The little trick we describe in the "Flying" section, concerning the use of the throttle channel trim lever, only works if both controllers are connected using a Y-lead.

Preparations for building:
These building instructions include reduced-scale drawings of the die-cut sheets. Use these drawings to write the Part No. on each component using a soft pencil, then separate the parts from the die-cut sheets using a balsa knife. Trial-fit all parts before installation, as many are supplied slightly oversize to allow for trimming. Formers which are to be glued in the GRP parts must be trimmed very carefully, and should just make contact with the skin; they will push the mouldings out of shape if they press on the very thin shell.
You can deviate from the sequence described in these building instructions if you so desire, but it is up to you to think the consequences through!
Keep the building instructions, parts list, motors, servos, receiver and the selected battery to hand at all times during construction, as they are all useful aids. Micro-servos and a small receiver are basic essentials with models of this type.
Before starting construction thoroughly rub down the surfaces of all GRP parts with 400 abrasive paper, used wet.

Adhesives:
Since the basic built-up structures are supplied ready-made, we will only pass on a few tips here on the use of laminating resin. Compared with fast-setting epoxy, laminating resin is easier to apply accurately, and produces much stronger joints. The thin resin penetrates into the closest of joints and guarantees a 100% bond. In some positions the thin resin tends to flow out of the joint, but you can avoid this by thickening it with a thixotropic agent.

Wing:
The finished wing is required for checking the fit of the other components, so we will start by completing it. Sand both panels carefully overall, and sand the airfoil exactly as shown, especially around the leading edge. The root and tip sections are drawn on the plan. Make adjustments carefully using a balsa plane set to a fine cut (new blade!) and a dead-straight sanding block fitted with new abrasive paper. **Important**: the airfoil should be identical on both panels (for symmetrical stalling characteristics). Glue the wingtips (15) in place and trim them as per plan. Make the servo supports from part (35) and glue them in the wing set as deep as possible - see section A-A. If the space for the servos is not sufficient (the airfoil is very thin), you can safely shift the servo inboard by one rib bay. You can even move the servo inboard by two rib bays, but in this case the output shaft should face forward. The ailerons are actuated by a 0.6 mm Ø steel pushrod running in a snake inner, installed in a smooth, gentle curve through about 80 - 90°. Fix the snake sleeve securely in the wing. The recommended aileron servos are good-quality 9-gram types. The extension leads should be twisted, and we recommend a conductor cross-section of 0.25 mm². Cut off about 50 mm of the servo lead and solder the twisted lead to the servo wires, insulating the individual soldered joints carefully. Cut cable exits in the underside of the balsa wing skin, using the co-ordinates shown on the plan. The cable can now be threaded into its sleeve, leaving the root end inside the wing for the moment.
Fit the pushrod connector (25) to the servo and place it on its support. Glue wood blocks to the support on both sides of the servo to prevent it shifting, and secure the servo on its mount with a strip of 0.8 mm ply (or similar) and two self-tapping screws. Mark the position of the horn (18) on the aileron, drill a 4 mm Ø hole, and harden the wood by running a little cyano into the hole.
Seal the area of the wing around the pushrod connector (25) and the aileron pushrod (32) with an extra piece of sheet balsa. Set the servo to neutral, and cut an opening 5-6 mm in size to provide access to the pushrod connector (25). Cut a slot for the aileron pushrod (32), and install the pushrod temporarily.
This makes it possible to paint the model and then connect the ailerons, without having to remove the covering over the servo. Cut out the ailerons and seal the ends with scrap wood from the die-cut sheet.

Brushless power system:
Cut a slot about 40 mm long in the bottom wing skin at the nacelle position, and shorten the factory-fitted sleeve by about 30 mm using a small pair of pointed scissors. Solder the extension lead to the aileron servo wires and place the servo on the wing; this allows you to determine the point at which the power cables for the speed controllers are “tapped off” - see plan. Unwind the coiled cable slightly and remove about 3-4 mm of insulating sleeve from the positive and negative wires. Cut lengths of positive / negative cable for the speed controller, solder them to the bared wires, and insulate the joints carefully. Wind the signal lead for the speed controller (ideally a “fourth” colour - for example, white flex, Order No. 7457/01) onto the twisted servo lead, and secure it at a few points with short pieces of heat-shrink sleeving. The next step is to install the cable loom in the guide tube, but first you should re-direct the speed controller cables towards the centre of the model, and secure the end to the cable loom with a narrow strip of adhesive tape. The steel pushrods (32) supplied in the kit can be used to draw the cables through the guide tube, but a length of thin, soft iron wire is even better. Tape the end of the rod to the end of the cable, then pull the whole assembly into the tube working from the outside end. When the end of the speed controller cables reaches the slot (at the nacelle), remove the tape and pull the cables through the slot as you continue drawing the cable loom through the tube. The cable end should be stowed inside the wing during the covering process.
The wing panels should be joined using laminating resin (thickened with thixotropic agent), but first the wing dihedral should be checked, as shown on the plan. The root ribs must make good contact with each other! You will find a 4 mm Ø hole in the front part of both root ribs; cut a piece about 10 mm long from the beech dowel (29) and glue it in one hole using thin cyano. This makes it much easier to align the panels accurately. Apply the resin thinly to both root ribs, press the wing panels together firmly and tape or pin the joint. Carefully wipe off excess resin using a paper towel.
Sand off any resin residues when the glue has cured completely, and apply a strip of woven glass cloth (approx. 80 g/m², about 30 mm wide) over the wing centre joint to reinforce it.
The next step is to trial-fit the wing in the recess in the fuselage. Set it exactly central on the fuselage and secure it temporarily, so that you can mark the position of the dowels (26) on the leading edge. Remove

the wing and drill holes at the marked points, initially using a 3 mm Ø drill. Be sure to drill parallel to the underside of the wing. Open up the holes to 5 mm Ø. Cut two pieces of beech dowel (26) about 30 - 35 mm long and check that they fit in the holes in the fuselage. File out the holes if necessary, then press the dowels into the wing. Check that the wing seats correctly on the fuselage, and correct the position of the dowels if necessary. When everything fits correctly, glue the dowels in the wing using laminating resin.
Trim part (36) to match the wing dihedral and glue it in place with laminating resin as shown on the plan. Add the plywood plate (51) as shown. Section E-E shows how the bridge piece assembly is installed in the fuselage recess. Apply plenty of thickened laminating resin to bond the parts in place securely.
Glue the 3 mm ply reinforcement in the GRP fuselage fairing (3) as shown on the plan; it supports the scale antenna (63), and must be drilled 5 mm Ø to accept the M5 screw (31). Temporarily fix the wing to the fuselage and trim the edges of the fairing (3) to follow the wing section accurately. You will also need to saw off the bottom of the front face of the fairing (3) horizontally; a diamond cut-off disc makes this job easy. When the fairing (3) is an accurate fit on the wing, mark the position of the hole in the bridge piece (51) using a 5 mm Ø drill bit held at right-angles to the underside of the wing. Remove the fairing, and check that the marked point is exactly central! Drill through the wing and the bridge piece (50 + 37) using a 4 mm Ø drill. Open up the hole in the wing to 5 mm Ø, cut a thread in the bridge piece using an M5 tap, and run a few drops of thin cyano into the threaded hole to harden the wood. Run the tap through the hole again once the glue has set hard.
The aluminium sleeve (30) serves as a spacer for the wing retainer screw (31); this means that it must transmit the pressure of the screw head to the wing. Here is our suggestion: open up the 5 mm Ø hole in the fairing to about 8.2 mm Ø, so that the aluminium tube is an easy sliding fit. Fit the screw (31) through the wing from the underside and fit the aluminium sleeve (30) on the screw shank. Now fit the fairing (3) over it, leaving the sleeve (30) projecting slightly. Mark the correct length of the sleeve (30), cut it to length and check that it now ends flush. When you are satisfied, bevel one end of the tube using a countersink bit, so that the countersunk screw head bears on the full thickness of the sleeve.
Before installing part (30) permanently, de-grease the metal and roughen the surface carefully: place the tube on a hard surface, lay a sharp file on it, and roll it to and fro under light pressure.
The first step is to glue the aluminium sleeve (30) to the wing using thickened resin. Fit the screw (31) through the hole in the wing from the underside, slip the sleeve (30) on the screw shank and apply a generous fillet of resin all round the joint. Cut small plywood plates and glue them to the inside face of part (3) at the same time - see fuselage side elevation and section B-B.
While the resin is still soft place the wing on the fuselage, apply thickened resin to the top end of the sleeve (30) and place the fairing (3) over it. The screw (31) acts as a guide to thread the sleeve through the fairing. Place the fairing (3) on the wing and align it carefully with the fuselage, then tighten the screw (31) lightly. Apply a little cyano round the periphery of the fairing to fix it to the wing, then apply laminating resin all along the joint to form a permanent bond. Allow the glue to set hard, then tighten the retaining screw firmly prior to trimming the canopy (9) to fit. The canopy must fit neatly on the fuselage and also on the fairing (3).
Cut out the canopy (9) slightly oversize - it should project by about 1.5 mm at the front - and trim it back gradually to obtain a close fit. A balsa plane set fine (please - use a new blade!) will quickly and accurately trim the edges of the plastic. The job can be finished using a sharp file laid at an angle on the edge of the moulding. Remove the wing once the canopy is a perfect fit.
Tape the canopy on the fuselage, and cut out the cockpit moulding (7). Chamfer the bottom edges until it fits neatly inside the canopy (9) - see also section B-B and the fuselage side elevation. Cut a strip of 3 mm plywood about 10 - 12 mm wide, and glue it to the rear face of the cockpit moulding. Glue strips of plywood to the sides of the cockpit in the same way. These must be slightly overlength, as they are intended to rest on the front face of the fairing (3) - see section B-B and the fuselage side elevation. Trim the pilot's seat (8) to fit and glue it in the cockpit. Drill 3 mm Ø holes in the crosswise ply strips to accept the dowels (57), and glue them in place - see section B-B and the fuselage side elevation. With the wing securely fixed to the fuselage, mark the position of the dowels on the front face of part (3) (without the canopy!), then drill the holes using a 2.5 mm Ø bit. These holes should now be opened up gradually using a round file until the dowels are a snug fit in them. Check that everything fits properly when the canopy is in position.
Paint the cockpit using plastic kit enamels, e.g. Humbrol or Revell, after masking out the fuselage with narrow tape where glue will be applied later. Place the cockpit in position, apply adhesive to the sides of the cockpit moulding, and carefully place the canopy in position. Tape it to the fuselage and leave the adhesive to harden fully.
Trim the half-former (53) to fit in the fuselage, and glue it in place with thickened laminating resin. Cut a slot in the fuselage for the actuating lever of the canopy latch (20), and shorten the lever as shown. Drill a 4 mm Ø hole in the half-former (53) to clear the latch pin (20) - see fuselage side elevation. Open up the hole to about 5 mm Ø using a round file, and tack the latch (20) in place with a little cyano (don't glue it

permanently!). Hold the half-former (52) against the fuselage as shown on the plan and mark on it the position of the latch pin (20). Drill a hole at the marked point using a 2.5 mm Ø bit, and gradually open it up to 3 mm Ø until the half-former (52) fits snugly on the latch pin. Note that the pin must not project beyond part (52) - see plan. Place the canopy on the model and check that the half-former (52) fits correctly. When you are satisfied, glue part (52) in place using Stabilit-Express.
The remaining work on the fuselage is largely self-explanatory. Note the following points: areas of the fuselage where formers are to be glued should be roughened using abrasive paper. Drill 2 mm and 3 mm Ø holes in the formers for the snake outers as shown. When installing formers in the fuselage, position the part first, tack with a few drops of cyano, then apply a fillet of resin (thickened as required). Mark the position of the snake openings on the fuselage as shown on the plan, drill them using a 2 mm Ø bit and file them out to final size. Don't install the snakes at this stage.
The line of the rudder is marked on the fuselage, but a second line must also be marked, located 4 mm aft of the first (see section H-H - this is where the GRP shell of the rudder should end. The best tool for separating the rudder from the fin is a diamond disc cutter, held in a firm hand! Clean up the edges of the shell neatly.
The position of the GRP hinge lugs (62) is shown on the plan; mark them on the tail post, which is already installed, and cut an additional oval opening about 6-7 mm wide as per plan. Cut pieces of the aluminium tube (22) about 5 mm long and press one into each hinge lug. Check they are "square" and glue them in place with thin cyano. Sand off the excess tube length. Drill a hole 5-6 mm Ø in the underside of the fuselage in the position shown.
Sand back the leading edge of the rudder to the new marked line, and glue the false leading edge (56) in place. Cut a piece of balsa strip (60) to fit in the bottom of the rudder, and glue it in place. Seal the rudder with scraps of plywood. Mark the position of the hinge lugs (62) on the false leading edge (56) and cut the slots for them - see fuselage side elevation and section H-H.
We recommend the following method of attaching the rudder: cut four pieces from the aluminium tube (22) as shown on the plan. Apply slightly thickened resin to the slots in the tail post and the hinge lugs, push the lugs into the tail post, and fit the aluminium tube (23) (or a length of 3 mm Ø steel rod) through the hole in the underside of the fuselage. Now follow this procedure carefully: slip the bottom end of the tube (22) onto the shaft, and fit this through the bottom hinge lug (62); continue with the next section of part (22) etc. Press the rudder against the sections of tube (22), and tape the rudder to the fin. Align the hinge lugs (62) carefully (they must be central and at right-angles to the tail post), and press the sections of tube (22) onto the hinge lugs from above. This locates the hinge system accurately, and the sections of part (22) can be tacked to the false leading edge (56) using single drops of cyano. Leave the fuselage standing vertically on its nose while the glue sets hard, then remove the hinge shaft and apply more glue to the hinge lugs in the tail post as required.
The rudder leading edge assembly is shown in section J-J. The best way of fitting parts (59) and (64) is to cut them into sections corresponding to the distance between the hinge lugs (62). Check the leading edge radius carefully, fit the rudder in the fin recess and check the freedom of movement. Once everything fits and works correctly, seal the wooden surfaces by covering them with tissue.
All you need to do now is seal the top and bottom of the fin with plywood - note that the bottom piece must have a 4 mm Ø hole. The rudder should not be installed permanently until the model has been painted overall. Cut the tubular rudder shaft (23) to the correct length: it should extend right to the bottom of the fuselage. Seal the opening in the bottom of the fuselage with tape to prevent the shaft falling out; just remove the tape if you ever need to remove the rudder.
The tailplane is aligned on the fuselage using pieces of beech dowel (29), which also increase the strength of the joint. Cut two pieces 80 mm long from the dowel (29) and fit them through the holes in the fuselage. Fix the wing to the fuselage and check the incidence of the dowels relative to the wing. Check also that they are square to the fuselage centreline. The dowels should be glued from the inside, so first withdraw the rear dowel to give access to the front one. Using a piece of strip wood, apply slightly thickened resin through the opening in the tail post and rotate the dowel to distribute the resin thoroughly. Repeat the procedure with the rear dowel.
Sand the tailplane to the final profile (especially the leading edge) as shown on the plan, and sand all the parts smooth, including the elevators. Fit one panel on the dowels and drawn a line on the root surface corresponding to the outline of the fuselage. Trim the root area back using a sanding block until it rests snugly against the fuselage. Repeat with the second panel. It is better not to glue the tailplane to the fuselage until the panels have been tissue-covered. Drill 3 mm Ø holes in the elevators at the angle shown on the plan, apply thin cyano to the holes, then run the drill through again.
At this stage all the wooden parts should be covered; we recommend using tissue.
The ideal material is our 23 g/m² Ply-Span, Order No. 7610/29. The wings are supplied with 3 mm of geometrical washout as standard; be sure to maintain this during the covering process, and correct it if there is any change. Apply several coats of clear dope to seal the covering. We recommend a final coat of

spray filler. Once sanded down “wet” this forms an ideal surface for the painted finish.
Covering with iron-on film: in this case it is better to cover the wing with the nacelles already fitted. Remember to leave about 2 mm free of film at the root of the tailplane panels, so that the resin has a sound surface for adhesion.

Nacelles:
First cut away the lateral cooling air outlets. Cut another cooling opening in the bottom; the dimensions are shown in the side elevation and section M-M. Cut out the air outlet fairings (13), trim them to fit, and glue them in place using Stabilit-Express or thick cyano. Trim the nacelles gradually in the leading edge area to obtain a neat fit on the wing without unsightly gaps.
The die-cut parts for the two-part motor bulkheads (39, 40) are designed for our “400” geared motors and the actro C with GRP bulkhead (Order No. 7002/87). If you wish to use motors with nose bulkhead mounting, the motor bulkheads must be modified as shown in section N-N. First rub a little laminating resin into the inner die-cut lines and allow it to cure, and only then glue together parts (39) and (40) using slightly thickened resin, pressing them together firmly. Mark the position of the openings from section N-N, and cut them out using a fretsaw. Important: the motor thrustline must be 3 mm higher than the centre of the bulkhead - as shown on the plan. This offset ensures that the front end of the motor shaft exits the cowl (4) in the centre when the correct motor downthrust is set. Install the motor mounts, Order No. 7120/95, and secure the nuts with Stabilit-Express. Sand back the outside edges of the bulkhead at an angle as shown. Set the bulkhead flush with the front edge, re-check the vertical alignment with the nacelle, then tack the parts together using thin cyano. Apply a fillet of laminating resin to strengthen the joints.
If you are fitting brushless motors cut a slot for the On/Off switch (BEC switch; see “Power system”) in the left-hand nacelle.
You will find three holes in each wing panel designed for the nacelle mountings. Each nacelle is fitted with two plywood plates (48, 49) to accept the screws (33).
Carefully mark the centreline of the nacelles on the wing; check that they are exactly parallel to each other. Align the nacelles as accurately as possible, hold them in position, and mark the centre of the screw holes on the plywood plates using a 4 mm Ø drill bit. Drill these holes using a 3.2 mm Ø bit and cut an M4 thread in the holes. Apply a little thin cyano to harden the wood, then run the tap through again.
The length of the cowls (4) should be 84-85 mm. The quickest way of trimming them is to place the cowl on the table and hold a narrow-point felt-tip pen against it at a height of about 2 mm. Rotate the cowl through 360º to mark the cut line. Cut to the line, then check that the cowl fits on the nacelle snugly, without being tight. Sand back the outside of the nacelle slightly if necessary. Cut eight discs of scrap plywood about 6 mm Ø, and glue four of them in each cowl where it is screwed to the nacelle, using cyano. Drill 1.8 mm Ø holes for the screws. Fit the cowl on the nacelle, align it carefully, and continue the 1.8 mm Ø holes through the nacelle. Glue small pieces of ply on the inside of the nacelles, and drill 1.6 mm Ø holes through the wood to accept the fixing screws.
Free the covered openings on the bottom of the wing. Cut the power cables (1.5 mm² conductor cross-section) in half, twist them together slightly and draw them into the guide tube using a length of soft wire or similar. Solder the wires together in the centre of the wing. In both power variants the motors are wired in parallel, i.e. the cables to the flight battery are soldered to these points. Both motors therefore receive the full battery voltage.
If you are fitting brushless motors, withdraw the servo lead from the wing, establish the correct length (you must be able to reach it through the motor bulkhead!) and solder it to the servo connector.
The method of connecting the aileron servos to the receiver (using a home-made extension lead) is shown on the plan. The motors (or, more accurately, the speed controllers) are connected to the receiver using a Y-lead, although only the signal wire from the receiver is used. Current is fed to the speed controllers via the cables tapped off at the aileron lead positions. This means that three servo wires are required; the best way of completing the interface between fuselage (receiver) and wings is to use a 4-pin plug and socket.
Roughen the outside edge of the nacelles (the joint surface) with coarse abrasive paper, apply thickened resin, place them on the wing and secure each one with three screws (33). Don’t tighten the screws fully until you have installed both nacelles and checked that they are located correctly, i.e. that they are parallel! Wipe off excess resin using a paper towel, and clean up the surface with petrol or enamel thinners (not cellulose!) prior to painting.
For brushless motors first install both speed controllers, and rotate the units so that the cables from the flight battery are at the front, and run into the nacelle under the controller. This ensures that the cables cannot make contact with the jackets of the actro motors. Run the three wires from the motor to the rear through the opening in the motor mount (you will need to enlarge it slightly at the front), taking the same safety measures as already described. All that remains now is to fit the dummy engines.

Cut out the dummy radial engines (6), place them in the cowls and mark the centreline of the cylinders on the cowl, as shown in the drawing on the plan. From the balsa strip (60) cut off three pieces about 15 mm long, trim them to follow the curvature of the cowl, and glue them in place. The dummy engines are glued to these spacers later. We recommend that you cut a circular template 88 mm in diameter, as this makes it easy to align the balsa spacers, and thereby ensure that the dummy engines are truly central. Paint the engines with plastic kit enamels; they should be glued in place only after the cowls have been painted.
The first choice for painting the model overall is Orapaint; the correct base paint colour is U.S. NAVY midnight blue. Apply the decals to the finished surface, then apply a coat of highly thinned EKS clear lacquer (high gloss) from the same manufacturer.

Flying:
Balance the model very carefully; for the first few flights we recommend a Centre of Gravity position of around 70 - 75 mm, but every pilot has to establish his personally "correct" CG position himself. Set the control surface travels as shown on the plan. Slide the flight battery right into the fuselage nose, with the cable facing forward, until it is possible to lower the rear end of the pack onto the support. Slide the battery back into position, and secure it with foam rubber at the front. Fix the pack to the support using a rubber band or similar.
With the recommended size of propeller the optimum rotational speed for an absolutely safe hand-launch is 8400 rpm. At this speed the static thrust is considerably above 1 kilogram. This is plenty of power, and more would just represent wasted energy.
If you use more than 8 cells the rotational speed (with 480 and brushless motors) will be way above the optimum figure. If you are using brushless motors the increased current will still be "safe", but the load on 480-size motors will be excessive, and the brushes and commutator will not last long.
Nearly all computer-controlled transmitters offer a method of programming the throttle channel (servo "travel" reduction for the speed controllers), as well as asymmetrical throttle channel trim, i.e. the trim works either at the "forward" or "back" end of the stick travel. With other transmitters the trim effect is independent of the throttle stick position. If you have asymmetrical throttle trim, set the trim range to "forward". Now start the motors, measure the rotational speed, and run them up to speed if necessary using the trim lever.
The advantage of this procedure is that extra "on-board" energy is available which you can exploit deliberately, exactly as required. As battery voltage declines during a flight, you can compensate for this by gradually moving the trim lever, and this enables you to fly in a really spirited manner for the full duration of the flight, or "open the taps" at will for aerobatics. You effectively have a turbo-charger available, and it becomes possible to fly towering stall-turns, for example. Caution: if you use 8 cells the BEC circuit will cut the power when the motors are still pulling strongly, and one motor (the one connected to the active BEC) will stop before the other! To avoid problems you should be aware how long you can safely fly, and initiate the landing approach in good time - every time!
We always recommend that you carry out a "dry run" (experimental test-run on the ground), without the cowls fitted.
This model demands to be flown in a spirited style, as befits a scale model of this powerful aircraft. For scale speed you only need a propeller speed of around 7000 rpm or less. In the hands of an experienced pilot the Tigercat's aerobatic capabilities are impressive. Although the wing loading is relatively high, this offers advantages in dynamic aerobatics (higher kinetic energy); however, the landing speed is always manageable.

We hope you have many hours of pleasure flying your new model.

Happy landings!

"aero-naut" Modellbau

PARTS LIST - GRUMMAN F7F-3 TIGERCAT

Part	Description	No. off	Material	Dimensions [mm]
1	Fuselage	1	GRP	Ready made
2	Nacelle	1+1	GRP	Ready made
3	Fuselage fairing	1	GRP	Ready made
4	Cowl	2	Plastic	Ready made
5	Dummy engine 1	2	Plastic	Ready made
6	Dummy engine 2	2	Plastic	Ready made
7	Cockpit	1	Plastic	Ready made
8	Pilot's seat	1	Plastic	Ready made
9	Canopy	1	Plastic	Ready made
10	Inlet	2	Plastic	Ready made
11	Outlet	2	Plastic	Ready made
12	Plate	1	Plywood	3, die-cut
13	Outlet fairing	2	Plastic	Ready made
14	Wing panel	1+1	Balsa	Ready made structure
15	Wingtip	2	Balsa	Ready made
16	Tailplane	1+1	Balsa	Ready made structure
17	Elevator	1+1	Balsa	Ready made structure
18	Horn	5	Plated brass	Ready made
19	Screw	5	Brass	M2 x 18
20	Canopy latch	1	Brass, steel	Ready made
21	Self-tapping screw	8	Plated steel	2.2 Ø x 6.5
22	Tube	1	Aluminium	4 Ø / 3 Ø, as plan
23	Tube	1	Aluminium	3 Ø / 2.5 Ø, as plan
24	Pushrod connector	2	Plated steel	4.5 Ø / 2 x 10
25	Pushrod connector	2	Plated steel	6 Ø / 2 x 8
26	Dowel		Beech	5 Ø, as plan
27	Snake inner tube	2	Plastic	2 Ø / 1 Ø, as plan
28	Snake outer sleeve	2	Plastic	3 Ø / 2 Ø, as plan
29	Dowel		Beech	4 Ø, as plan
30	Tube	1	Aluminium	8 Ø / 6 Ø, as plan
31	Screw	1	Plastic	M5 x 85
32	Pushrod	2	Steel	0.6 Ø, as plan
33	Screw	6	Plastic	M4 x 30
34	Mild steel rod	1	Plated steel	1.5 Ø, as plan
35	Servo support		Plywood	1, as plan
36	Trailing edge strip	1	Balsa	5 x 20, as plan
37	Plate	1	Balsa	3, as plan
38	Strip		Balsa	6 x 6, as plan
39	Motor bulkhead	2	Plywood	3, die-cut
40	Motor bulkhead	2	Plywood	3, die-cut
41	Fuselage former	1	Plywood	3, die-cut
42	Fuselage former	1	Plywood	3, die-cut
43	Fuselage former	1	Plywood	3, die-cut
44	Fuselage former	1	Plywood	3, die-cut
45	Fuselage former	1	Plywood	3, die-cut
46	Fuselage former	1	Plywood	3, die-cut
47	Servo mount	1	Plywood	3, die-cut
48	Screw plate	2	Plywood	3, die-cut
49	Screw plate	2	Plywood	3, die-cut
50	Plate	1	Plywood	3, die-cut
51	Screw plate	1	Plywood	3, die-cut
52	Half-former	1	Plywood	3, die-cut
53	Half-former	1	Plywood	3, die-cut
54	Plate	1	Plywood	3, die-cut
55	Plate	1	Plywood	3, die-cut
56	False rudder leading edge	1	Plywood	3, die-cut
57	Dowel		Beech	3 Ø, as plan

58	Plate		Balsa	2, as plan
59	Strip	1	Balsa	4 x 12, as plan
60	Strip		Balsa	15 x 10, as plan
61	Hinge lug	3	GRP	Ready made
62	Strip		Balsa	10 x 3, as plan
63	Strip		Balsa	10 x 8, as plan
64	Tube		Brass	1.5 Ø / 1.1 Ø

As plan: dimensions taken from plan or model

DIE-CUT SHEET DRAWINGS