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per No di listino 4629

KWIK FLY MK 3

JOHANNES GRAUPNER · 7312 KIRCHHEIM-TECK · GERMANY


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KWIK FLY MK3
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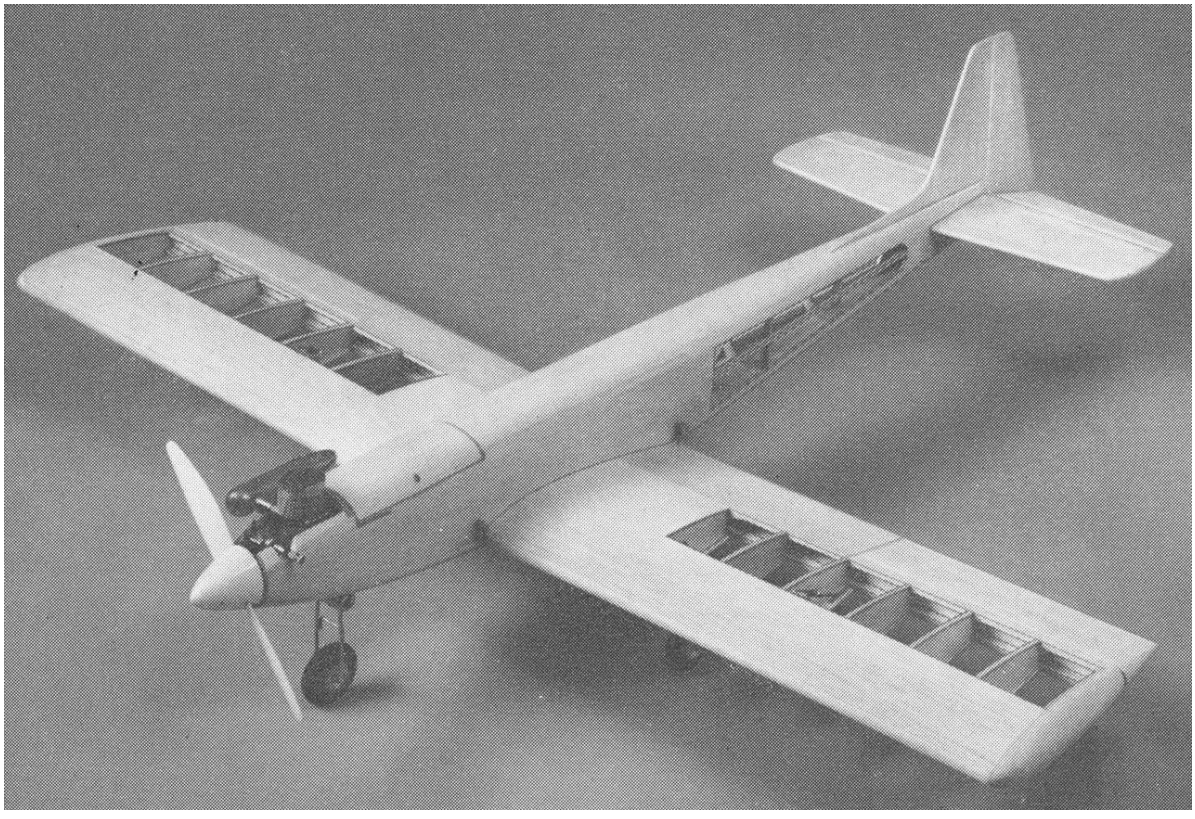

Building instructions

KWIK FLY MK 3

R/C low wing model for aerobatic flight

Designed by Phil Kraft, USA

Takes proportional and / or multi-channel R/C gear and .60 cu.in. engines

An "exploded view" sketch

of the model is provided as a special insert in the German-language version of the building instructions. Removed from the center pages and used in conjunction with the building instructions it greatly facilitates the assembly of the model.

For illustrations refer to German text please

Technical data

Span	$59^1/_2$"
Length	$50^3/_8$"
Wing area	657 sq.in.
Stab area	152 sq.in.
Total surface area	809 sq.in.

Flying weight

depending on R/C gear installed	approx. 6 lbs and more

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Preface

The aerobatic multi-channel R/C model KWIK FLY MK 3, designed by Phil Kraft, USA, is the winner of the '67 World Championship Contest in Corsica.

On this occasion, as on many others — such as the '67 Nats in the USA — it gave a splendid account of its superior performance and won. The development of this model lasted several years. Its name — KWIK FLY MK 3 — indicates that this is the third bird of the family. The design was thoroughly tested under a variety of weather conditions and was given the "full treatment". As a result KWIK FLY MK 3 is a fully developed and matured model design, which is bound to satisfy even the highest demands.

The aerodynamic configuration of the model was tailored to the new stunt schedule. Its lines are simple and clear. The fuselage provides ample room for the installation of GRAUPNER/GRUNDIG proportional R/C equipment DIGITAL TX 14/RX 14 with DIGIMATIC R control servos. As an alternative choice the popular GRAUPNER/GRUNDIG VARIOPHON S/VARIOTON S equipment may be installed. This equipment, too, permits to fully exploit the flying potential of KWIK FLY MK 3. Any modifications resulting from the installation of this type of R/C gear are left to the modeller's discretion.

The RC INSTALLATION PLAN RC 68 describes the installation of the DIGITAL set with DIGIMATIC R control servos.

The RC INSTALLATION-PLAN RC 69 explains the proper method of installation of the digital proportional VARIOPROP R/C equipment.

Phil Kraft aimed for a particularly low flying weight in order to gain ample power reserve for stunting. In order to achieve such a low weight, the QUICKIE KIT contains selected balsa wood. He who wishes to reduce the flying weight still more, may omit the colour finish and replace it by coloured tissue paper.

If your are not aiming for the ultimate in performance you may leave out the longerons (58) and the gussets (59) — (62) and fill the open framework of the fuselage sides with $^1/_8$" sheet balsa. An adequate amount of material for sheeting is supplied in the kit.

The plan shows two optional methods of attaching the wing. One is the conventional type using dowels and elastics, which was used on the world championship model, the other is the aerodynamically cleaner one employing plastic wing holddown bolts (Parts I—IX).

Phil Kraft. had cut off the engine flanges in order to retain a reasonable wall thickness in the engine cowl. You may want to duplicate this installlation. The engine backplate mount is, of course, only suitable for engines with forw'd facing carburettor. This mount is not contained in the kit but may be ordered under indent No. 149.

General information

The kit comes with the more important components pre-shaped in order to reduce building time and to simplify your work. The bent and glued forw'd side panels, the milled tips and the pre-shaped (milled) tank hatch deserve being mentioned here. The remainder of the parts is die-cut. These parts are carefully removed from the sheets with a sharp knife and de-fuzzed, prior to the assembly of the model. Make it a standing rule to fit and sand all parts prior to their final assembly.

Use a straight, plane plank of softwood for a building board.

R/C equipment	Controls (max.)	Recommended engine	Longitudinal dihedral	Propeller
DIGITAL TX 14 VARIOPROP VARIOPHON S VARIOTON S 10-channels	rudder elevator engine throttle ailerons carb-needle setting wheel brake steerable nosewheel landing gear (coupled to rudder)	OS MAX H-60 F RC .60 cu.in. 10 cc.	up to + .5°	11 x 7" 28 x 18 cm

Assemble major components right over the plan. Place all parts required for their assembly (that is for wing, fuselage, empennage) on the bench, in numerical order.

Pin the plan to the softwood board and protect it by a sheet of transparent or waxed paper.

The assembly of the model follows the numbering of its parts. Contrary to standard procedure the assembly of this model starts with the wing. The two optional methods of fastening the wing are the reason for this departure from usual practice. Parts (19), (52), (59)—(62), (66) and (92) consist of 2 parts each. They are cemented together and shaped as per plan. In addition to them several other parts in the list of materials carry a note: 2 parts. They should be cemented as indicated on the plan.

Use UHU-hart or RUDOL--hart for all glueings, unless otherwise stated. For large and long glueing surfaces and for cementing the bulkheads, UHU-coll is the proper choice. Use UHU-kontakt, indent No. 957, for the quick and easy application of the forw'd wing planking panels, while UHU-plus, indent No. 950/41, should be used for metal-wood connections. The two latter cements are not contained in the kit.

The building instructions

follow the sequence of the parts numbering. The instructions apply to the dowel-and-elastics method of wing attachment. For those who prefer the wing holddowns, the installation of the required parts (I)—(IX) is readily explained in the text. Whenever components of the R/C equipment must be installed while the model is being assembled, these steps, too, are described, mentioning the parts number of the supplementary list of materials on the RC INSTALLATION PLAN RC 68. For all other instructions concerning the installation of R/C gear in this model refer to the RC INSTALLATION PLAN RC 68.

Appropriate instructions for the installation of those parts of the VARIOPROP equipment which must be installed in the course of the assembly of individual structural groups of the model are always given at the end of the building instructions for the group in question. Further installation instructions are provided in the RC INSTALLATION-PLAN RC 69. The "exploded view" drawing which comes with the instructions shows the installation of DIGITAL TX 14 / RX 14 equipment.

Don't fail to use the plan, the "exploded view", the photos, list of parts, stripwood and sheetwood keys all the time; they all are useful and necessary tools.

The wing

consists of parts (1)—(41).

Cut, fit and cement the top main spar (1) and the doubler (2) over the plan, which is protected by transparent paper. Use cement profusely (see fig. 2). Same goes for the bottom member of the main spar (3) and its doubler (4). Then assemble parts (5)—(8), as per plan.

Fig. 1 KWIK FLY MK 3, 3-view drawing.

Be sure to cement all parts well, w i t h o u t a n y g a p s, as these reduce the strength of the wing.

Fig. 2 Top main spar cemented with doubler; lower main spar with doubler in the foreground.

After the cement has set you may start with the assembly of the right (starboard) wing panel over the plan protected by waxed paper.

First step is pinning an auxiliary strip onto the building board, as per sectional view F—F on plan sheet 1. Pin the lower auxiliary spar on top of the auxiliary strip, then pin the lower main spar to the board and cement ribs (9)—(14) to main and auxiliary spars. When inserting the ribs be sure to c o r r e c t l y p o s i t i o n the f i l e d openings for the control linkage and the bellcranks of the R/C equipment (Refer to plan and sectional views).

The top members of the spars and the leading edge (15) come next, cement. Minor differences between the spacing of the leading edge slots (15) and that of the plan view on plan sheet 1 should not worry you; modify, where necessary. Finally the false ribs (16), (17) and the false aft ribs (18) are cemented as per plan. Line-up parts (16) and (18) at the center to suit the angle indicated on the plan.

Figure Starboard wing panel during assembly.

Cement landing gear bracket rib (19) and bolt l. g. bracket (20) to it. Carefully fit and cement part (19). Now add rib brace (21) to rib (11). This phase of the assembly is shown in fig. 3. The wing panel is then removed from the building board. Drill the main l. g. mount for the l. g. wire, then carefully fit and cement it to the wing structure; a v o i d g a p s and use cement p r o f u s e l y.

Place plan upside down on building board for the assembly of the left (port) wing panel and lightly grease the paper with a cotton wad soaked in oil to make the printed lines shine through. Use same procedure for the assembly of this wing panel as described above. Block up the right hand wing panel for proper dihedral.

Fig. 4 The wing framework during assembly.

Carefully cement the main spar web (23) and the webs of the auxiliary spar (25) in position, after sanding the latter accordingly. (See sectional views B—B and G'G). Finally add the two remaining ribs (26).

Prepare the control servo panel (CC) (see RC INSTALLATION PLAN RC 68) cement nuts (E) to it, then cement panel between the two ribs (9) and add 2 corner braces (DD). Insert the wing planking supports (27) between panel (CC) and part (23).

In case you wish to use wing holddown bolts, proceed as follows: Cement the two rib braces (II) to the false ribs (I) and insert and cement the brass tube (III), after cutting it to proper length, in the slot, using UHU-plus. The two false ribs are then fitted and cemented.

Use the wing positioning bracket (VII) with two inserted dowels (VI) as a spacer gauge for the insertion of the two false ribs. Insert the dowels from the front, through the holes in the leading edge.

This method assures equal spacing of the two cemented false ribs and the holes of the wing positioning bracket in the fuselage.

The holddown version of wing attachment requires the fitting and flush-cementing of the two limewood trailing edge reinforcement wedges (IV) between the false ribs (18).

These parts are not required, if the dowel-and-elastics method of wing attachment is used.

Fit the forw'd top planking (28) now. Use UHU-kontakt for this step (and adhere to glueing instructions supplied with the cement). Trim excess planking material flush with the main spar, using a sharp balsa knife. Then add the top planking aft section (29). For the wing with elastics the planking extends right to the center of the wing.

Fig. 5 The aft section of the wing planking is held with clamps until dry.

The holddown type of wing attachment requires the removal of part of the planking in order to permit the installation of the base plates (V). These parts are fitted and cemented in position (See sectional view C—C and plan view of wing).

Now remove the wing from the building board and carefully fit the left main l. g. mount (22); cement well. The upper wing planking (29) must be chamfered as per sectional view D—D! During the application of the remaining planking panels (forw'd and aft) the wing is always pinned to the building board — as a safeguard against warping. If you prefer a particularly clean looking aileron installation, insert the Perlon ribbon, which serves as an aileron hinge, between the auxiliary spar capping (29a) and the auxiliary spar when you get to that phase of the build later on.

You may encounter a couple of difficulties, though: the glueing stations may harden, they are no longer flexible and the Perlon ribbon is only too easily damaged when the

framework is sanded. In case the hinges are to be attached atop the spar capping (29a), the latter should be mounted on the auxiliary spars now. The two main l. g. struts (30) are now mounted in parts (22) with the aid of brackets (31). The mid-section wing top planking (32) is also added, using UHU-kontakt. It provides an opening to permit access to the aileron servo and stands $^{13}/_{64}$" proud of the sides of ribs (9). The lower mid-section planking (33) totally encloses the wing center section and is joined by a Perlon ribbon cemented inside the wing near the servo position. Provide a cut-out in the planking to permit the installation of the l. g. brackets (31).

Now assemble the two ailerons. They consist of parts (34)—(38) and are assembled in the sequence of the numbering of their parts. Be sure to build one right and one left aileron. Install the aluminum control horn (GG) with UHU-plus (not contained in the kit) during assembly (see sectional view A—A of the RC INSTALLATION PLAN RC 68).

Fig. 6 Right and left ailerons during assembly.

He who prefers a concealed installation of the Perlon hinges in the ailerons should take the appropriate steps while assembling the ailerons.

Add the rib capping (39) — (40) and the braces (40 a) to the wing structure and fasten the wing tips (41). Then sand the wing structure and the ailerons. Attach ailerons with Perlon hinges to the wing now, make sure that they are freely movable. Reinforce the trailing edge of the wing by glueing a Perlon ribbon along it with UHU-plus, to prevent the elastics from cutting it.

The rigidity of the trailing edge of the wing can be improved still more by cementing one of the surplus threaded rods (R) of the accessory set, indent No. 119, to either side with UHU-plus and Perlon ribbon.

Now sand the wing v e r y t h o r o u g h l y, following the sectional views of the plan. This step is most important in view of the desired low flying weight.

The installation of the R/C components in the wing is explained in the RC INSTALLATION PLAN RC 68.

On installation of VARIOPROP R/C equipment be sure to refer to RC INSTALLATION-PLAN RC 69 and to

1. provide ribs (9) — (13) and parts (19) and (21) with recesses and holes to suit this type of R/C equipment (These recesses etc. are not shown on plan sheet 1; they are shown on the parts mentioned above, however, and are marked by the inscription RC 69).
2. remove one flange from part (20) and mount the latter with a single bolt or screw.
3. omit parts (27) and panel (CC), as per RC INSTALLATION-PLAN RC 68 and "exploded view" drawing. They are replaced by part (V and W, as per RC 69). In this case the size of the opening in the top center planking (32) should be such as to permit access to the control servo. Part (V) and (W) are contained in the set of accessories.

The fuselage with empennage

consists of parts (42)—(97).

Cement the triangular corner braces (43) to the underside of the fuselage top block (42). The slots for fin and dorsal strake are located on the upper side of the fuselage top block (42). The corner braces (43) are $^{13}/_{64}$" set back from the edges and must be fitted at the end. In order to assure equal set back of the two corner braces from the edge, the $^{13}/_{64}$ sq. strips are pinned flush with the edges. Now mark the spacing of the bulkheads on the fuselage top block, as per plan. Be sure to cement the two bulkheads (44), (45) and (46), (47) exactly as shown on the plan. The bulkheads (44)—(51) may then be glued to block (42) at right angles and with the proper side facing forward.

Fig. 7 The fuselage top block, with bulkheads cemented to it, and the pre-curved side panels.

He who has decided to use dowel-and-elastics wing attachment cements parts (52) to bulkhead (44). For the holddown version replace part (52) by the wing positioning bracket (VII). File an opening in part (VII), which is to take tube (L) (refer to RC INSTALLATION PLAN RC 68). Cement supports (A), equipped with special nuts, to right and left fuselage sides (53) and (54) (see RC INSTALLATION PLAN RC 68). Attach pre-curved side panels with lots of cement. Secure in position with clamps until thoroughly dry.

Fig. 8 Attaching the two fuselage sides.

Then add the fairing strips (55) and inserts (56). Fit parts (57) and (58) next and cement. Gussets (59)—(62) brace the structure. The firewall (63) is now prepared for its installation, which includes drilling the holes for the engine backplate mount (64*) and the nose wheel l. g. bracket. Also drill holes for the two tubes (K) (see RC INSTALLATION PLAN RC 68) and file to suit. The plan shows the installation of part (64*) and the l. g. bracket on the firewall. The position of the nose wheel l. g. bracket requires the countersinking of the special nut of the engine mount plate at the rear face of firewall (63).

Fig. 9 The firewall complete with bolted home nose wheel l.g. bracket and nuts. At right and left are the nose wheel l.g., ready for installation, and the engine mount plate.

The engine mount plate cannot be attached! The two remaining special nuts are fastened with woodscrews! Bolt the nose wheel l. g. bracket to firewall with the countersunk screws supplied in the kit.

Now fit firewall (63) and horizontal bulkhead (66) and cement them well to all adjoining parts.

This phase of the build requires care and accuracy. The firewall must sit perfectly perpendicular, as correct down and side thrust depend on its exact installation. It should be 0° in both cases.

Slightly cut the triangular corner strips (67) with a scroll saw at several stations and cement them to the side panels inside the fuselage between the two foremost bulkheads. Parts (68) serve to brace the firewall. Fit them carefully and cement well. Cement the tubes (K) and (L) to the side panels with UHU-plus (as per RC INSTALLATION PLAN RC 68).

Provide openings in the attached lower fuselage planking for the nose wheel landing gear and the tube (L) (see RC INSTALLATION PLAN RC 68). Cement planking (70) and part (71) in one step. Bulkheads (72) and (73) serve as supports for the stunt tank, 30 cu. in. capacity, indent No. 136 (not contained in the kit). Fit and cement them as per plan. The inner faces of the engine cowl sides (74) are recessed to permit the installation of the engine (see exploded view). The cowl sides are then cemented to the fuselage sides and to bulkhead (63). The remaining parts (75)—(77) of the engine cowl are cemented next. The nose section (77) of the engine cowl should be slightly larger in diameter than the prop spinner; this leaves some leeway for fairing and blending. The hatch holddown brackets (78) are fashioned from beech dowels and cemented to the sides of the tank compartment. Cement parts (80)—(82) to the hatch (79). The hatch, with all parts attached, must accurately fit between bulkheads (44) and (63). Countersink appropriately for the two wood screws (see sectional view C—C, plan sheet 2).

Fig. 10 The uncovered fuselage, ready for sanding.

Protect plan by a sheet of waxed paper and assemble the stabilizer framework right on the plan from parts (83)—(86). Sand, when dry. Then add planking panels (87) with UHU-coll. Use a perfectly plane plank as a building board for this step, otherwise the structure is bound to be warped!

Fig. 11 The stabilizer prior to the application of the top planking. Placed at its side are the components of the vertical tailsurfaces.

Sand the two elevators (88) and join them by part (89); make sure that they are properly aligned.

The elevator is now fastened to the sanded stabilizer with the aid of a Perlon ribbon. The completely assembled tailplane is now attached to the fuselage, in the slot at the rear end of the latter, perpendicular to same and wih zero incidence, using plenty of cement. Reinforce the joint by adding Perlon strips in the corners. The fin (90) and the dorsal strake (91) are now cemented into the slot on the top side of the fuselage top block, at right angles to the stab. Add the strake fairing (92). The bottom end of the rudder is reinforced by cementing a brace (94) to it. Sand when dry. The rudder, too, is freely movable mounted to the rounded fin with Perlon ribbon.

The entire fuselage framework is now very thoroughly sanded with sanding paper of various grades (start with the coarsest type) as per sectional views. The fuselage section aft of the wing in particular should be very well sanded in order to reduce its weight. This in turn means less ballast; the flying weight is lowered and performance that much better.

Mate engine cowl to engine and remove balsa on inner side, until the engine with backplate mount may be inserted from above.

Insert and cement the two dowels (95) required for attaching the wing with elastics.

Plan sheet 2 illustrates that the two mounting panels (VIII) are cemented to the inner faces of the fuselage sides in case the holddown method of wing attachment is used. The two dowels (95) are here omitted, of course. The bracket is then mounted on this panel, as per illustration (also refer to assembly instructions to indent No. 147).

The canopy (96) is not fastened until the fuselage has been sanded, doped and colour finished. If the aft section of the fuselage is to be planked the gussets (59)—(62) are omitted; cut the planking panels (97) from $^1/_8$" sheet balsa.

Fig. 12 KWIK FLY MK 3 during assembly.

The assembly of the framework is finished with the completion of this step.

On installation of VARIOPROP R/C equipment be sure to refer to RC INSTALLATION-PLAN RC 69 and to

1. cut only recess (RC 69) in bulkhead (48)
2. omit rails (A) with special mounting nuts (see RC INSTALLATION-PLAN RC 68 and exploded view)
3. file or drill holes for tubes (E) and (F) at the appropriate positions of the bulkheads (see RC INSTALLATION-PLAN RC 69)
4. cement the tubes in position with UHU-plus. Don't forget to use wedges of scrap balsa.
5. drill holes (RC 69) in bulkheads (46), (47) to take the elastics.

How to mark the exact hole position for the holddown bolts in the wing

The drilling centers for the two plastic bolts (8) in the wing are found in the following manner:

Sharpen the end of the bolts a bit, smear the tips with a lead pencil, then screw bolts into brackets from the opposite side, until their tips stand approximately $^3/_{64}$" proud of the wing support of the fuselage. Then slip the wing dowels into the appropriate holes, align the wing and press it against the tips of the bolts. The resulting indentures of the bolt points mark the exact drilling stations. When drilling the two $^1/_4$" Ø holes, be sure to drill them perpendicular to the bolt head support. (Refer to illustration of plan).

Fig. 13 Rig for measuring the angular difference between wing and stab setting (longgitudinal dihedral).

① Elastics for attaching the pendulum
② Test stand
③ Scale
④ Pendulum

Fig. 14 Instrument for measuring the longitudinal dihedral.

⑤ Airfoil center line
⑥ Datum line
⑦ Balsa, mated to airfoil contour
⑧ Needle
⑨ X equal distance to airfoil centerline
⑩ Pine
⑪ Scale with division into degrees glued on
⑫ Thread
⑬ Lead
⑭ Plywood

Notice: The texts to fig. 3 and 4 are coded by numbers put in circles to facilitate their retrieval in the foreign language versions of the instructions.

Proper longitudinal dihedral

is a must. Check the correct angular setting of wing and tailplane while mating the wing to the fuselage. This requires the use of two devices which are simple to build and to use. The illustration indicates their design and construction. (Materials for building the devices are not supplied in the kit).

For checking place the model on the stand and attach a pendulum each to wing and tailplane with elastics, as shown in fig. 13.

The pendulums must be able to move freely with adequate clearance from the scale; the thread must not touch the latter. When attaching the pendulums be sure to line them up with the airfoil center line, so that they are perpendicular to the reference line. Adjustments should be made by packing up. By observing the indicated angles and by subtracting them from eachother the angular difference is established. For this model it should be + .5°. See side view of model.

As the tailplane has already been firmly mounted to the fuselage, any faults can only be corrected by appropriate sanding of the wing platform of the fuselage.

Primer coat

The fuselage and the empennage are given two coats of GLATTFIX porefiller, indent No. 207 (not contained in the kit). Sand both coats with very fine sandpaper when thoroughly dry. The engine cowl and the tank compartment are given the same treatment and the wing, too, gets a primer coat of GLATTFIX.

Covering the model

Synthetic silk KUNSTSEIDE, white, indent No 615 (not contained in the kit) is a suitable covering material. Covering the entire fuselage including the empennage with it, is recommended, as it greatly improves the strength and durability of the model. The instructions supplied with the KUNSTSEIDE pack inform you abou the correct method of its application and its treatment.

Finishing the model

Fuselage and empennage get 2—3 coats of heavily thinned clear SPANNFIX IMMUN (indent No. 1408/1). Permit to dry well after application of intermediate coats. The wing gets 3—5 coats of clear SPANNFIX-IMMUN and is pinned to the building board for several hours after each coat.

For the colour finish use fuel-proof SPANNFIX-IMMUN, indent No. 1408/—15, with colours of your choice.

The box lid illustration shows Phil Kraft with his World Championship model. The colour scheme of the other, larger model depicted there differs from that of the winning model and shows an alternative colour scheme. It was used, in similar form, on a successor of the model shown in Corsica and makes the bird look still better, in our opinion. Take your choice of these two colour schemes.

Use coloured varnish sparingly on this model in order to keep the flying weight as low as possible. Keep in mind that coloured varnish is heavier than clear one. After application of the colour finish you may fasten the canopy.

Engine, stunt tank, nose wheel l. g. and main l. g. wheels

Attach engine with mounting plate with 3 M 4 bolts to firewall (63). Attention! The lower bolt must be shortened to $^{13}/_{32}$". The cubeshaped stunt tank, indent No. 136, is installed in the tank compartment. Carefully wrap the tank with foam rubber. This markedly reduces fuel foaming induced by engine vibrations and makes the engine run more smoothly. A fuel line is run from the tank to the carburettor, a second one, for holes must be drilled for both lines through bulkhead (63). For fuelling the fuel line must be removed from the carburettor. Installation of fuel line and vent tube is shown in an isometric sketch of the RC INSTALLATION-PLAN RC 69. Now install the nose wheel landing gear (s h o r t e n t h e w i r e s !) and bolt fast. For installation instructions refer to fig. 9, the plan and the instruction sheet supplied in the Quickie kit.

Secure the two main landing gear wheels in position by soldering washers to the axles on either side of the wheels.

Decals

are cut up into individual enblems, which are singly soaked in water for a short time (say 20—30 seconds) and cautiously slipped from their paper backing onto the appropriate station of the model. Permit to dry well!

How to install the R/C equipment

is fully described in the RC INSTALLATION-PLAN RC 68 and RC 69, resp. Be sure to work with care.

Balancing the model

is one of the most important steps of the build.

Fasten wing to underside of fuselage with 5 elastics $^{13}/_{32} \times {}^{3}/_{46} \times 3^{1}/_{8}$" Ø on either side, with elastics run parallel to the direction of flight.

In case the holddowns are used, bolt the wing in position.

Proper c. o. g. location is indicated on the side view of the model. When supported at this point on either side of the fuselage, the model must balance, with the nose pointing slightly downward.

Sheet lead required for the correction of either tail or nose heaviness should be firmly attached to the appropriate position in the fuselage. Use sheet lead, indent No. 548 (not contained in the kit).

Testflying

Proceed with common sense and care. Try to secure the help of an assistant. Prior to the first launching check the engine for smooth running at all attitudes. Then check the proper functioning of the R/C gear with running engine (use controls singly and simultaneously).

Select a suitable flying field for your first attempts at flying this model; the field should permit a rise of ground take-off and provide ample space, both on the ground and in the air, for your model. For testflying R. O. G. takeoffs are safest. Launch model against the wind. For initial flights make it a standing rule:

Do not try any maneuvers, but correct the attitude of the model only. Refrain from steering the model near the ground, unless the model is in danger; operate controls cautiously, with minimum throw of control surfaces.

Initial flights should merely serve to check the model's ability to perform in a normal, stable manner without being steered via R/C. GRAUPNER/GRUNDIG proportional R/C gear DIGITAL TX 14 / RX 14 and VARIOPROP, respectively, provides the possibility of correcting maladjustments of the model in flight by remotely trimming the control surfaces in question. But trimming is not meant to be a cure-all for warps. Any warps that may be present, must be permanently removed. He who has not yet acquired adequate skill in piloting R/C models is well advised to secure the help of an experienced R/C flyer, who has a couple of R/C models similar caliber to this credit.

Start aerobatics with simple maneuvers, such as inside loops, and permit your model to climb to a safe height before you attempt any stunts! You'll soon get more and more familiar with your model after each flight and pretty soon you'll find out how uncritical to fly your KWIK FLY MK 3 actually is. But before you'll really master it and all the maneuvers you'll have to practice, practice, practice! Sorry, there's no easy way out, but all the other chaps have to learn it that way, too.

Here's wishing you much fun flying the KWIK FLY MK 3—and happy landings!

July 1968 II

Plan texts plan sheet 1

① Wing center section with holddowns
② Plan view of wing; top planking and rib capping omitted for clarity
③ Ribs of left wing panel drawn perpendicular
④ Top mid-section planking (32) stands $^{13}/_{64}$" proud of part (9)
⑤ Cut out in top mid-section planking (32) provides access to aileron servo
⑥ Sectional view H—H
⑦ Sectional view A—A
⑧ Dihedral of wing
⑨ Sectional view B1—B1
⑩ Rear edge of glued planking
⑪ Sectional view F—F
⑫ Building board
⑬ Assembly of wing (prior to planking stage)
⑭ Auxiliary strip for wing assembly
⑮ Sectional view E—E
⑯ Sectional view B—B
⑰ Sectional view C—C
⑱ Double-pointed arrows indicate the grain direction of the wood, in the case of plywood that of the outer layers
⑲ Lower member of the auxiliary spar
⑳ Sectional view G—G
㉑ Chamfer appropriately before cementing the lower planking
㉒ Upper member of auxiliary spar
㉓ Lower member of main spar
㉔ Upper member of main spar
㉕ Sectional view D—D
㉖ Perlon

Plan texts plan sheet 2

① Sectional view A—A
② Sectional view B—B
③ Sectional view D—D
④ Sectional view E—E
⑤ Sectional view F—F
⑥ Optional planking panel (97)
⑦ Perlon
⑧ 0° angle of incidence
⑨ Double-pointed arrows indicate the grain direction of the wood, in the case of plywood that of the outer layers
⑩ +.5° angle of incidence
⑪ Center of gravity
⑫ Fuel tank, indent No. 136
⑬ Cut a couple of incisions with scroll saw in part (67)
⑭ Shorten nose wheel l. g. wire
⑮ Indent No. 137
⑯ Indent No. 116/1
⑰ Mate cowl to engine
⑱ Indent No. 149
⑲ Longitudinal axis of engine
⑳ Carefully blend engine cowl into part (77)
㉑ 1 right
1 left
㉒ Mate to wing airfoil (and mind that angle of incidence!)
㉓ Wing center section with holddown bolt and bracket
㉔ Sectional view G—G
㉕ Sectional view H—H
㉖ Butt-joint of planking panel
㉗ Sectional view C—C
㉘ Round leading edge
㉙ Cement foam rubber here
㉚ Use minimum width in order to provide adequate space for fuel tank

List of materials KWIK FLY MK 3

Part. No.	Designation	Amt. req.	Material	Dimensions in inches
1	main, spar, top	1	balsa	$57^{1}/_{2} \times {}^{15}/_{64} \times {}^{15}/_{64}$
2	main spar, doubler	1	balsa	$19^{5}/_{16} \times {}^{15}/_{64} \times {}^{15}/_{64}$
3	main spar, bottom	1	balsa	$57^{1}/_{2} \times {}^{15}/_{64} \times {}^{15}/_{64}$
4	main spar, doubler	1	balsa	$19^{5}/_{16} \times {}^{15}/_{64} \times {}^{15}/_{64}$
5	aux. spar, top	1	balsa	$57^{1}/_{2} \times {}^{13}/_{32} \times {}^{13}/_{64}$
6	aux. spar, doubler	1	balsa	$19^{5}/_{16} \times {}^{13}/_{32} \times {}^{13}/_{64}$
7	aux. spar, bottom	1	balsa	$57^{1}/_{2} \times {}^{13}/_{32} \times {}^{13}/_{64}$
8	aux. spar, doubler	1	balsa	$19^{5}/_{16} \times {}^{13}/_{32} \times {}^{13}/_{64}$
9	rib	2	balsa	${}^{5}/_{64}$, according to plan
10	rib	2	balsa	${}^{5}/_{64}$, a. t. p.
11	rib	2	balsa	${}^{5}/_{64}$, a. t. p.
12	rib	2	balsa	${}^{5}/_{64}$, a. t. p.
13	rib	2	balsa	${}^{5}/_{64}$, a. t. p.
14	rib	8	balsa	${}^{5}/_{64}$, a. t. p.
15	leading edge	2	balsa	$28^{3}/_{4} \times {}^{21}/_{32} \times {}^{23}/_{64}$, milled
16	false rib	2	balsa	${}^{1}/_{8}$, a. t. p.
17	false rib	4	balsa	${}^{5}/_{64}$, a. t. p.
18	false rib, aft section	4	plywood	${}^{5}/_{64}$, a. t. p.
19	landing gear bracing rib (2 parts)	2	plywood	${}^{5}/_{32}$, a. t. p.
20	l. g. main bracket	2	plastic	comm.item, ex indent No. 356/1
21	rib brace	2	plywood	${}^{5}/_{64}$, a. t. p.
22	main l. g. mount	2	ash	$6^{5}/_{16} \times {}^{5}/_{8} \times {}^{31}/_{64}$, recessed
23	main spar web	1	plywood	${}^{5}/_{64}$, a. t. p.
24	aux. spar web	1	plywood	${}^{5}/_{64}$, a. t. p.
25	aux. spar web	2	balsa	$13^{5}/_{16} \times 1^{1}/_{16} \times {}^{1}/_{8}$
26	web	2	balsa	$1^{13}/_{16} \times 3^{15}/_{64} \times {}^{1}/_{8}$
27	wing planking support	4	balsa	${}^{1}/_{8}$, a. t. p.
28	wing planking, front section	4	balsa	$28^{11}/_{16} \times 3^{35}/_{64} \times {}^{5}/_{64}$
29	wing planking, aft section	4	balsa	$15^{3}/_{8} \times 3^{53}/_{64} \times {}^{5}/_{64}$
29 a	aux. spar capping	4	balsa	$13^{11}/_{32} \times {}^{33}/_{64} \times {}^{5}/_{64}$
30	main l. g. strut	2	steel wire	comm.item, ${}^{5}/_{32}$ ∅
31	l. g. bracket	4	aluminum	${}^{5}/_{8} \times {}^{1}/_{4} \times {}^{1}/_{16}$
32	wing planking, mid-section, top	2	balsa	$8^{55}/_{64} \times 3^{15}/_{16} \times {}^{5}/_{64}$
33	wing planking, mid-section, bottom	2	balsa	$8^{55}/_{64} \times 3^{15}/_{16} \times {}^{5}/_{64}$
34	aileron planking, top	2	balsa	$13^{5}/_{16} \times 3^{15}/_{16} \times {}^{5}/_{64}$
35	aileron, rib	12	balsa	$13^{5}/_{16} \times 2^{27}/_{32} \times {}^{5}/_{64}$
36	aileron, leading edge	2	balsa	${}^{5}/_{64}$, a. t. p.
37	aileron planking, bottom	2	balsa	$13^{5}/_{16} \times 1^{1}/_{32} \times {}^{5}/_{64}$
38	aileron, tip	2	balsa	${}^{23}/_{32}$, a. t. p., pre-shaped
39	rib capping	22	balsa	approx. $7^{1}/_{2} \times {}^{9}/_{32} \times {}^{5}/_{64}$, all
40	rib capping	2	balsa	$^{51}/_{64} \times 3^{15}/_{16} \times {}^{5}/_{64}$
40 a	brace	2	balsa	$3^{29}/_{32} \times {}^{1}/_{4} \times {}^{1}/_{4}$
41	wing tip	2	balsa	${}^{63}/_{64}$, a. t. p., pre-shaped
42	fuselage top block	1	balsa	$35^{11}/_{16} \times 3^{3}/_{4} \times {}^{13}/_{32}$, pre-shaped

Liste of materials KWIK FLY MK 3

Part. No.	Designation	Amt. req.	Material	Dimensions in inches
43	triangular corner brace	2	balsa	$35^{27}/_{32} \times {}^{15}/_{32} \times {}^{15}/_{32}$
44	bulkhead	1	plywood	$^{5}/_{64}$, a. t. p.
45	bulkhead	1	balsa	$^{1}/_{8}$, a. t. p.
46	bulkhead	1	plywood	$^{5}/_{64}$, a. t. p.
47	bulkhead	1	balsa	$^{1}/_{8}$, a. t. p.
48	bulkhead	1	balsa-ply	$^{1}/_{8}$, a. t. p.
49	bulkhead	1	balsa-ply	$^{1}/_{8}$, a. t. p.
50	bulkhead	1	balsa-ply	$^{1}/_{3}$, a. t. p.
51	bulkhead	1	balsa-ply	$^{1}/_{8}$, a. t. p.
52	bulkhead doubler (2 parts)	1	balsa	$^{5}/_{32}$, a. t. p.
53	right fuselage side, forw'd section	1	balsa-ply	$^{15}/_{64}$, a. t. p., glued with proper curvature
54	left fuselage side, forw'd section	1	balsa-ply	$^{15}/_{64}$, a. t. p., glued with proper curvature
55	fairing strip	2	balsa	$24^{11}/_{32} \times {}^{15}/_{32} \times {}^{13}/_{64}$
56	fuselage insert	2	balsa	$^{13}/_{64}$, a. t. p., pre-shaped
57	fairing strip	2	balsa	approx. $26^{1}/_{2} \times {}^{15}/_{32} \times {}^{13}/_{64}$
58	longeron	2	balsa	$15^{11}/_{16} \times {}^{13}/_{32} \times {}^{1}/_{8}$
59	gusset (2 parts)	2	balsa	$^{5}/_{32}$, a. t. p.
60	gusset (2 parts)	2	balsa	$^{5}/_{32}$, a. t. p.
61	gusset (2 parts)	2	balsa	$^{5}/_{32}$, a. t. p.
62	gusset (2 parts)	2	balsa	$^{5}/_{32}$, a. t. p.
63	firewall	1	plywood	$3^{15}/_{16} \times 3 \times {}^{1}/_{4}$, pre-shaped
64*	engine backplate mount with bolts and nuts	1	aluminum	com.item, indent No. 149, not contained in the kit
65	steerable nose wheel landing gear	1	spring steel wire	comm.item, indent No. 137
66	horizontal bulkhead (2 parts)	1	plywood	$^{5}/_{32}$, a. t. p.
67	triangular corner strip	2	balsa	$6^{7}/_{64} \times {}^{7}/_{8} \times {}^{13}/_{32}$
68	firewall brace	2	lime	$2^{41}/_{64} \times 1^{25}/_{64} \times {}^{31}/_{64}$
69	fuselage bottom planking (2 parts) front section	1	balsa	$3^{3}/_{4} \times 6^{1}/_{2} \times {}^{1}/_{8}$
70	fuselage bottom planking, aft	1	balsa	$24^{21}/_{32} \times 3^{3}/_{4} \times {}^{1}/_{8}$
71	cross brace	1	balsa	$3^{9}/_{32} \times {}^{13}/_{32} \times {}^{1}/_{8}$
72	bulkhead	1	balsa-ply	$^{1}/_{8}$, a. t. p.
73	bulkhead	1	balsa-ply	$^{1}/_{8}$, a. t. p.
74	engine cowl, side	2	balsa	$^{51}/_{64}$, a. t. p., pre-shaped
75	engine cowl, bottom	1	balsa	$^{13}/_{32}$, a. t. p., pre-shaped
76	engine cowl, fillet	1	balsa	$^{13}/_{32}$, a. t. p., pre-shaped
77	engine cowl, nose	1	plywood	$^{5}/_{64}$, a. t. p.
78	hatch, holddown bracket	2	beech dowel	$^{19}/_{32} \times {}^{13}/_{32}$ ∅
79	hatch for tank compartment	1	balsa	$6^{1}/_{32} \times 3^{3}/_{4} \times {}^{29}/_{32}$, pre-shaped
80	hatch frame, bottom	2	plywood	$^{5}/_{64}$, a. t. p.
81	hatch frame, front	1	plywood	$^{5}/_{64}$, a. t. p.
82	hatch frame, aft	1	plywood	$^{5}/_{64}$, a. t. p.
83	stab, leading edge (2 parts)	1	balsa	$15^{9}/_{16} \times 11^{57}/_{64} \times {}^{51}/_{64} \times {}^{13}/_{64}$
84	stab, trailing edge	1	balsa	$23^{5}/_{8} \times {}^{51}/_{64} \times {}^{13}/_{64}$
85	stab, tip	2	balsa	$2^{9}/_{16} \times {}^{51}/_{64} \times {}^{13}/_{64}$

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Part. No.	Designation	Amt. req.	Material	Dimensions in inches
86	stab, diagonals	12	balsa	$22^{21}/_{32} \times {}^{13}/_{64} \times {}^{1}/_{8}$, all
87	stab, planking (2 parts)	2	balsa	$23^{5}/_{8} \times 5^{21}/_{64} \times {}^{1}/_{16}$
88	elevator	2	balsa	$11^{27}/_{64} \times 2^{31}/_{64} \times {}^{1}/_{4}$, pre-shaped
89	elevator joiner	1	pine	$4^{17}/_{32} \times {}^{13}/_{32} \times {}^{1}/_{4}$
90	fin	1	balsa	${}^{1}/_{4}$, a. t. p., pre-shaped
91	dorsal strake	1	balsa	${}^{1}/_{4}$, a. t. p., pre-shaped
92	strake fairing (2 parts)	1	balsa	${}^{1}/_{4}$, a. t. p.,
93	rudder	1	balsa	${}^{1}/_{4}$, a. t. p., pre-shaped
94	rudder base reinforcement	1	balsa	$4^{37}/_{64} \times {}^{15}/_{32} \times {}^{1}/_{4}$
95	wing dowel	2	beech dowel	$5^{3}/_{64} \times {}^{5}/_{16}$ Ø
96	canopy	1	plastic	comm.item
97	planking	4	balsa	$15^{5}/_{32} \times 1^{37}/_{64} \times {}^{1}/_{8}$
	Parts required for the installation of wing holddowns: (of these, parts I—VIII are contained in the kit)			
I	false rib	2	plywood	${}^{5}/_{64}$, a. t. p.
II	rib brace	4	balsa	${}^{1}/_{8}$, a. t. p.
III	brass tube	2	brass	$1^{25}/_{64} \times {}^{9}/_{32}$ OD, ${}^{1}/_{4}$ ID
IV	t. e. reinforcement (wedge)	2	lime	$1^{47}/_{64} \times 1^{25}/_{64} \times {}^{33}/_{64}$
V	baseplate	4	plywood	$1^{57}/_{64} \times 1^{37}/_{64} \times {}^{5}/_{64}$
VI	dowel	2	beech dowel	$2^{7}/_{32} \times {}^{1}/_{4}$ Ø
VII	wing positioning bracket	1	plywood	$3^{9}/_{32} \times 1 \times {}^{5}/_{32}$, pre-shaped
VIII	mounting panel (doubler)	2	plywood	${}^{5}/_{64}$, a. t. p.
IX *	holddown bracket	2	plastic	comm.item, indent No. 147, not contained in the kit

Notice:

Two parts in the list of materials are marked by an *. They are not contained in the kit, but are separately available as commercial items:

64 * engine backplate mount with bolts and nuts — indent No. 149
IX * wing holddown set — indent No. 147
a. t. p. = according to plan; true dimensions must be derived from the plan.

Also required and contained in the kit:

1 tube UHU-hart or RUDOL-hart
1 bottle UHU-coll
3 RECORD-ELASTIK wheels with special hub, $2^{3}/_{8}$ Ø, indent No. 116/1
4 countersunk bolts M 3 (${}^{1}/_{8}$) c ${}^{19}/_{32}$, for attaching the nosewheel landing gear strut to the firewall.
4 cylinderhead bolts (shorten!) M ${}^{7}/_{64} \times {}^{51}/_{64}$, for fastening the main l. g. brackets (parts 20), ex indent No. 705/20
2 semi roundhead woodscrews ${}^{5}/_{64} \times {}^{13}/_{32}$, for fastening the tank compartment hatch
8 semi roundhead woodscrews ${}^{5}/_{64} \times {}^{9}/_{32}$, for fastening the landing gear brackets
4 lock nuts, M 2,6, for fastening the l. g. main brackets, ex indent No. 714
6 washers, ${}^{15}/_{64}$ OD, ${}^{1}/_{8}$ ID, ex indent No. 718
4 washers, ${}^{23}/_{64}$ OD, ${}^{11}/_{64}$ ID, ex indent No. 560/7, for fastening the wheels
10 elastics, ${}^{13}/_{32} \times {}^{3}/_{64} \times 3^{5}/_{32}$ Ø, for attaching the wing, indent No. 50/80

1 Perlon ribbon (rudder hinge, wing t. e. reinforcement, stab/fuselage joint) 86 x 1, ex indent No. 110/2
2 balsa strips for fuselage assembly, $36^{1}/_{4} \times {}^{13}/_{64} \times {}^{13}/_{64}$
1 balsa strip for wing assembly, $29^{17}/_{32} \times {}^{27}/_{64} - {}^{23}/_{64} \times {}^{13}/_{32}$
1 decal KWIK FLY MK 3
1 decal KWIK FLY MK 3
1 decal owner's adress

Required, but not contained in the kit:

GLATTFIX, porefiller, primer for balsa surfaces, indent No. 207
SPANNFIX-IMMUN, for doping and colour-finishing, indent No. 1408/1—15
approx. 3 yards synthetic silk, white, .09 ozs.per sq.ft., for covering the model, indent No. 615
1 cube-shaped stunt tank, approx. 30 cu.in. capacity, indent No. 136
1 pack UHU-plus, indent No. 950/41
1 tube UHU-Kontakt, indent No. 957
sheet lead for balancing the model, indent No. 548
foam rubber packing for the fuel tank

For fastening the wheels without soldering (optional method):
4 lockrings, ID $^{5}/_{32}$, OD $^{5}/_{16}$, ex indent No. 138/4
1 special screw driver for the lockrings, indent No. 140
In place of the RECORD-ELASTIK wheels you may also install:
3 AIR ELASTIC wheels (pneumatic), $2^{9}/_{16}$ Ø, indent No. 143/64

Recommended engine, propeller and accessories:

1 OS MAX H-60 F RC, .60 cu.in., indent No. 1460 s (complete with mounted throttle and muffler)
1 SUPER-NYLON propeller 11 x 7, indent No. 1316/28/18
1 carburettor needle setting gear, with special carburettor needle, indent No. 1612
1 propeller spinner $2^{7}/_{16}$ Ø, indent No. 128
TITAN fuel line, $^{1}/_{8}$ ID, ex indent No. 1325/2, length to suit, for fuel system and filler tube extension

Strip wood key

The tables below (that is: strip and sheet wood keys) are intended to help modellers properly use the wood parts contained in the kit.

Amt. req.	Material	Dimension in inches	Req.d for part No.
3	balsa	$32\frac{5}{16} \times \frac{9}{32} \times \frac{5}{64}$	39
2	balsa	$32\frac{5}{16} \times \frac{31}{64} \times \frac{5}{64}$	29 a
2	balsa	$29\frac{17}{32} \times \frac{13}{64} \times \frac{1}{8}$	86
1	balsa	$36\frac{1}{4} \times \frac{13}{32} \times \frac{1}{8}$	58, 71
2	balsa	$29\frac{17}{32} \times 1\frac{1}{16} \times \frac{1}{8}$	25, 36
2	balsa	$36\frac{1}{4} \times \frac{13}{64} \times \frac{13}{64}$	aux. strip for fuselage assembly
6	balsa	$32\frac{5}{16} \times \frac{13}{32} \times \frac{13}{64}$	5, 6, 7, 8
4	balsa	$29\frac{17}{32} \times \frac{31}{64} \times \frac{13}{64}$	55, 57
2	balsa	$29\frac{17}{32} \times \frac{51}{64} \times \frac{13}{64}$	83, 84, 85
6	balsa	$32\frac{5}{16} \times \frac{1}{4} \times \frac{1}{4}$	1, 2, 3, 4, 40 a
1	balsa	$5\frac{1}{8} \times \frac{31}{64} \times \frac{1}{4}$	94
2	balsa	$29\frac{15}{16} \times \frac{21}{32} \times \frac{23}{64}$	15, milled, slotted
1	balsa	$13\frac{25}{32} \times \frac{7}{8} \times \frac{13}{32}$	67, triangular
1	balsa	$29\frac{17}{32} \times \frac{13}{32} - \frac{15}{64} \times \frac{13}{32}$	aux. strip for wing assembly
2	balsa	$36\frac{1}{4} \times \frac{31}{64} \times \frac{31}{64}$	43, triangular
1	balsa	$4\frac{47}{64} \times \frac{13}{32} \times \frac{1}{4}$	89
1	lime	$9\frac{27}{32} \times 1\frac{25}{64} \times \frac{33}{64}$	IV, 68, doubly conical
1	ash	$13 \times \frac{41}{64} \times \frac{31}{64}$	22, with groove
1	beech dowel	$5\frac{29}{32} \times \frac{1}{4}$ ∅	VI
1	beech dowel	$10\frac{41}{64} \times \frac{5}{16}$ ∅	95
1	beech dowel	$1\frac{31}{32} \times \frac{13}{32}$ ∅	78

Sheet wood key

Amt. req.	Material	Dimension in inches	Req.d for part No.
4	balsa	$25\frac{5}{8} \times 2\frac{49}{64} \times \frac{1}{16}$	87
2	balsa	$31\frac{1}{2} \times 3\frac{15}{64} \times \frac{5}{64}$	34, 37
6	balsa	$31\frac{1}{2} \times 3\frac{53}{64} \times \frac{5}{64}$	28, 29
2	balsa	$19\frac{11}{16} \times 3\frac{15}{16} \times \frac{5}{64}$	32, 33, 40
1	balsa	$31\frac{1}{2} \times 3\frac{5}{32} \times \frac{1}{8}$	97

Use the sheet aluminum contained in the kit for fashioning part No. 31

The kit contains the required lengths and quantities of wood stock plus a reasonable amount of reserve material where required.