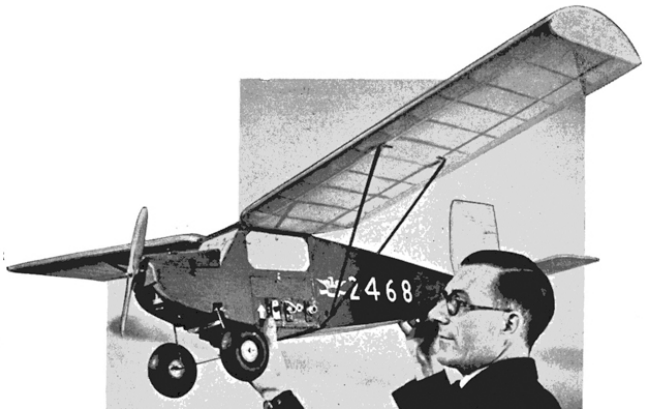
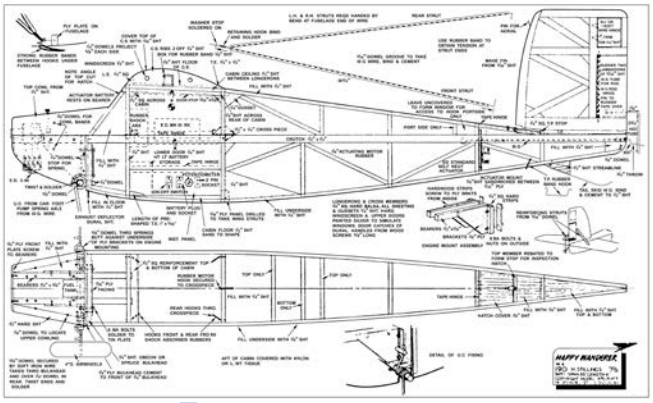
Happy Wanderer





Following his Radio Control for Beginners Series Harry Stillings Describes his Fine Model Build Especially for Radio Contol.

Happy Wanderer embodies the experience gained in two years of concentrated effort in R/C flying, and was designed to provide a stable, reliable model which would perform with complete consistency week in, week out, without need for more than a brief check-over before being put away for the next time. It, therefore, had to be rugged and extremely good-tempered, yet have a safe glide which would make spot landings a matter of course. Happy Wanderer has passed all tests, in varying weather conditions, with flying colours. Provided it is built exactly according to plan (especially as regards c.g., dihedral, fin area, rudder area, position and movement) it should fly " right off the board," and so allow the newcomer to R/C to concentrate on gaining experience in control without having to worry about the capabilities or safety of the model. R/C novices would, however, be well advised to " swot up " the " R/C for Beginners " series in the April to July issues of MODEL AIRCRAFT, so that the radio side of the operation is also properly covered before test flights begin.

Construction is straightforward, and well within the scope of any modeller who has successfully built a few power sports models. All woods are hard balsa, except medium block for wing root.

Fuselage: This is of crutch construction, and the first step is to build two sides over the plan in the usual way. Fill in 1/4 in. sheet where shown, except front compartment, which is filled in later after undercarriage installation has been completed. When set, cut apart, turn upside down and pin to plan view at cabin top. Add all cross-pieces as far back as rear of cabin, making sure (with help of a set-square) that the sides are dead square. When set, draw ends of tail together and cement, holding in place with a strong spring clip. Now add all remaining crosspieces,' and leave to set. Meanwhile you can save time by cutting out wing and center section ribs ready for use later. Remove fuselage from plan, and add sheet filling aft of cabin (top and bottom), cabin ceiling and floor (latter must be sanded to follow contour of fuselage) and tail bay, top and bottom. Fill in cabin and engine bulkheads after cutting to take engine bearers according to motor used. Add 1/8 in. and 1/16 in. ply front and back of engine bulkhead, and fit dural or aluminium exhaust deflector, which is a great help in preventing exhaust fuel from running back along the bottom of the fuselage. A groove is cut between the 1/8 in. ply and the 1/4 in. sheet, and the deflector is cemented and pinned (using steel pins) in position. The front compartment floor is now filled in with ½ in. sheet and sanded to follow fuselage contour. Doors are not fitted until radio installation has been completed. Mount actuator on 1/8 in. sheet faced both sides with 1 mm. or 1/32 in. ply, and cement in position, making sure spindle lines up accurately with rear tube bearing, which is 14 gauge brass or aluminium tube not more than 1 in. long. Add actuator inspection hatch and 1/8 in. sheeting adjoining. Hinges for doors and hatches throughout are made of tape, with large- head screws as " handles" and dural or aluminium turn-buttons for securing. Ply plates for struts can now be cemented in position, and 1/2 in. X 1/4 in. cross-piece at center

Happy Wanderer

rear of cabin (with hooks already cemented in place). Front receiver hooks are fitted in cabin bulkhead. Fit tail hook and dowel, also tail skid. Don't forget the important reinforcing pieces front and rear of cabin ceiling and front of cabin floor. Windscreen of ¼ in. sheet should now be fitted, and hatch cut for actuator battery (note angle of top cut to form stop). This completes main fuselage construction, which should be set aside to harden thoroughly.

Centre Section: This is built over plan, which is self-explanatory. Wing locating dowels must not protrude more than amount shown, otherwise they will lose their " knockoff" " qualities. When set, cement center section firmly to cabin ceiling, maintaining pressure while setting by passing strong rubber bands from wing dowels under fuselage to dowels on opposite side.

Engine Mounting and Undercarriage: Cement engine bearers in position, and add ply brackets as shown on plan. Small § in. square engine bearers (as sold ready for use in small models) are ideal as hardwood strips for attaching ply brackets. Drill bearers (to suit engine) slightly oversize to allow for adjustment of thrust, 2 deg. to 4 deg. right thrust will be needed, and 2 deg. to 3 deg. down thrust—these can only be finally decided by trial in flight. The undercarriage is made up from a pair of car foot-pump springs—these can be obtained from Halfords, and are ideal for the purpose. They are indestructible, however hard the landing, and always return to their original position, whilst their shock-absorbing qualities are far better than any other type of undercarriage springing I have come across. They are held in position by passing a length of 3/8 in. dowel through the spirals as an axle, which butts up against the lower edges of the ply brackets, and is secured in position with two loops of soft iron wire passing back through the engine bulkhead and over a length of ¼ in. dowel as shown on plan. The wire loops are twisted tight and the twist soldered. Bind and solder a 1 o-gauge piano wire axle to the legs to take the 4 in. diameter airwheels. The upper arms of the springs are held against the front bulkhead with ¼ in. dowel passing through and cemented in the ½ in. sheet sides (which can now be fitted). Fill in the ¼ in. sheet between sides and bearers, and fit ply front plate. Fuel tank fits between bearers (mine was made up from sheet tin), and upper cowling is made up from ½ in. sheet as shown on plan, with hole cut out for needle valve. Two 1/8 in. stub dowels are cemented either side of bearers, and holes drilled in upper cowling for locating, cowling being held in position with rubber bands over similar stub dowels as shown. This completes engine and undercarriage construction, and ¼ in. sheet sides should now be filled in, in front compartment.

Wings: Straightforward construction is quite clear from plan, but remember to tilt root ribs 10 deg. for dihedral.

Wing Struts: Make up exactly as per plan, but remember to make a left and right, and not two the same !

Tailplane: Build up entirely of hard 3/16 in. strip (with 3/16 in. filling in center bay), omitting end pieces and trailing edge. Cover top and bottom with hard 1/32 in. sheet. End pieces and trailing edge are then securely cemented in place. Sand leading edge to rounded shape.

Next month we deal with the radio installation and flying instructions, together with a plan of the wings.

Article Part 1

Model Aircraft Magazine November 1954

Happy Wanderer

Harry Stillings, the designer of "Happy Wanderer," is the subject of this cartoon, drawn by his brother G. W. Stillings. Harry, a commercial artist himself, took up model flying shortly after the last war and played a leading part in the growth of the Exeter M.A.C., acting as club and area secretary.

This summer he has given many successful flying demonstrations with his radio model at local fetes and fairs.

Last month Harry Stillings dealt with the construction of the fuselage and wings of his Happy Wanderer and in his concluding article he describes the installation of the radio receiver and gives flying instructions.

Fin and Rudder: Build over plan make sure rudder is absolutely free by testing that it instantly falls by its own weight when fin is held flat. Loop is formed from 16-gauge piano wire, stapled and cemented in place, with tape strengthening strips cemented on each side. See that loop is dead in line with rudder trailing edge so that both neutral positions are identical and really neutral. When set, fin can be cemented in place on tailplane, care being taken to see that it is held dead upright and central until quite hard. Note that lower ends of fin struts must be cemented in position indicated (i.e., over 3/16 in. rib, and not over unsupported 1/32 in. sheet).

Radio Installation: Actuator has already been fitted, so take a length of 16 gauge piano wire and get it dead straight this may take some time, as piano wire can be most contrary, but persevere, as straightness of the drive is most important to reliable actuator operation. Now bend crank exactly as shown on plan the amount of rudder throw has been very carefully arrived at by exhaustive trial with an adjustable crank. Fit rubber motor (flat 1/8 in. well lubricated, one loop 18 in. long). Add switch, sockets, etc., on switch panel on port side, or use your own personal layout, as desired. The h.t. l.t. battery pack is located on cabin floor against bulkhead, retained in position with a strip of 1/2 in. square hard balsa cemented to floor, and rubber band over small hooks in this strip and bulkhead. Actuator battery (preferably flat 4 1/2 V flashlamp type) is housed in compartment behind windscreen (partly for weight distribution purposes) and should not be placed in cabin. After completing wiring-up. receiver is held in position in cabin with rubber bands over the hooks in each corner. For additional safety cement half a rubber sponge at back of cabin bulkhead against which receiver can safely strike in the event of a heavy impact overcoming the tension of the rear bands. Aerial is taken through small hole in rear of cabin ceiling, with knot tied inside to allow ample " play." The upper and lower doors on each side can now be fitted.

Covering: Nylon is the most durable covering material, but heavy weight Modelspan is satisfactory. Cover fuselage from rear of cabin to tail, wings and fin. Cover sheeted tailplane with lightweight Modelspan, and give all three coats of dope, taking care to avoid warps. Colour may be added as desired.

Flying: Model must balance at point shown test glide over long grass (fully equipped) and note carefully any tendency to stall or nose-dive. Correct stall by packing leading edge of tailplane 1/32 in. at a time until glide is quite flat. To correct nose-diving tendency pack trailing edge 1/32 in. at a time until glide is flat. If there is a natural " built-in " tendency to turn either way, correct by adjusting trim- tab a little at a time until glide on neutral is dead straight. Start power-on tests with prop back to front, or revs, kept down, and with 2 deg. right thrust and 2 deg. down thrust. Limit first flights to about 2 min. power run, and make

Happy Wanderer

adjustments to glide, thrust, etc., a little at a time. It must be emphasised that the glide is the criterion in trimming for R/C concentrate on getting this right by packing tailplane as required and adjusting trim-tab until glide is dead flat, with no tendency to stall or become steep, and is absolutely straight on neutral. Then correct turn, stall, etc., under power entirely by adjustment of engine thrust. If trim tab or tail- plane packing is used to correct power-on flight the glide will be all wrong when the motor cuts.

The prototype needed 1/16 in. packing under the leading-edge of tailplane for perfect glide, but each model will differ slightly and yours may need none. The model is very stable, with excellent recovery from turns, yet responds immediately to every signal. Provided the wheels are accurately tracked Happy Wanderer will take off into a beautiful scale climb after a 50-ft. run on short level grass, and less from a runway. Let the model gain height upwind, using the button only to keep her headed into wind if necessary. A left turn can be safely held on for 180 deg., but right is best taken in two " bites " of 90 deg., as the model will tighten up into a spiral if right is held on too long. This of course, is needed if stunts are attempted, and speed can be built up in a right spiral for loops, rolls off' the top, etc., and for losing height when required. When the model has gained about 50 ft. height upwind (or more if you wish) start flying backwards and forwards about 200 yards upwind of the transmitter. In this way, should anything go wrong, she will drift back towards you, and not away from you. When the motor cuts she will go into a flat stable glide, and as the turn is only slightly less than under power you will very soon be taking spot-landings as a matter of course. I have flown the original from a tree- surrounded field only 100 yd. X 50 yd., making spot landings every time; also from the edge of a 100 ft. cliff, out over a valley, and bringing the model back to a spot landing on the edge of the cliff only a few yards from the transmitter. This has been done in varying wind conditions from calm to fresh, yet no change in trim has been called for.

Needless to add, a strict pre-flight radio check should always be carried out before flying, and test- checks made during the day whenever you are indulging in a long session. If the ground is unsuitable for a take-off, hand-launching is easy, two or three running steps and a firm " shove " being all that is necessary.

Article Part 2

Model Aircraft Magazine December 1954