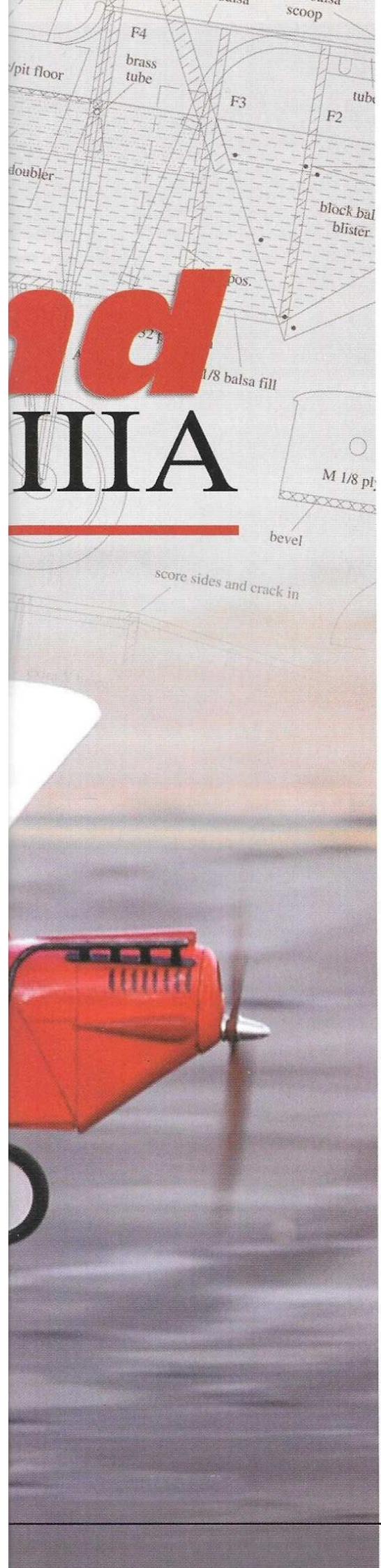
FULL-SIZE FREE PLAN FEATURE *by Peter Rake & Martin Crowder*

Westland Widgeon

An electric powered scale model designed by Peter Rake, built and described by Marion Crowder



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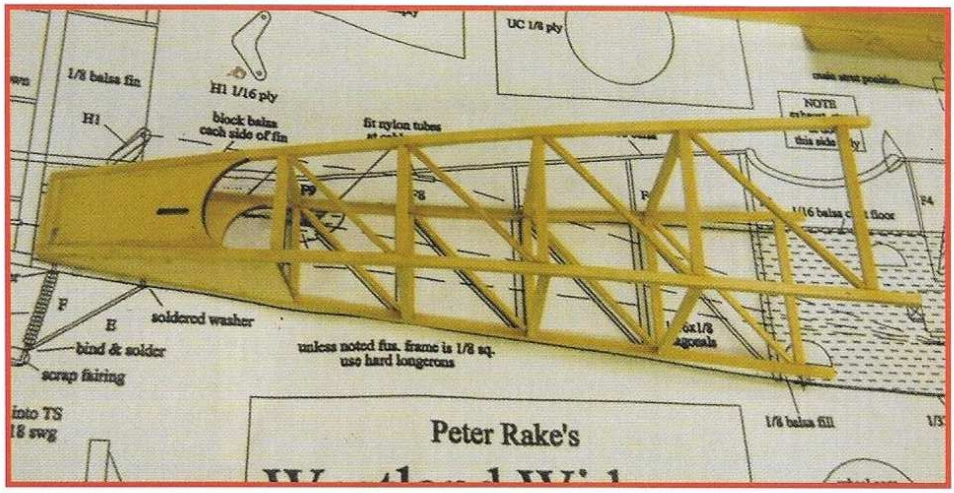
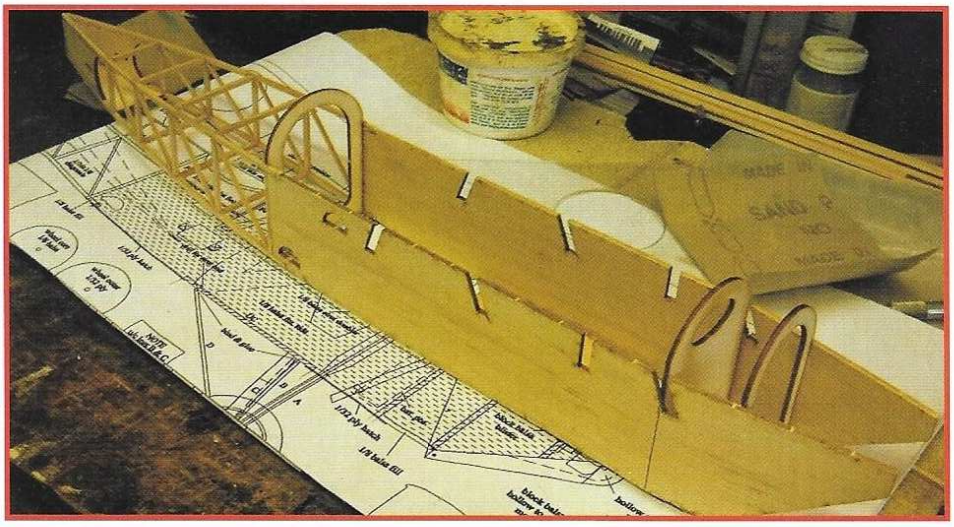


Typical Rake construction fuselage and here we see the rear basic box.



Front and rear basic assemblies joined. Note where the centre section struts fill be fitted.

The Westland Widgeon started life in 1924 as a two-seat parasol built for the Lympne trials set for that year. Built entirely of wood and fabric covered, with a 35 hp Cherub twin engine, this first version had highly tapered wings that folded flush against the fuselage. During a trial flight the lightly loaded and underpowered aircraft was pushed into the ground by a downdraft and totalled.

The remains were rebuilt into the Widgeon II with a 60 hp Armstrong Siddeley Genet engine. This particular version proved to have a better performance than the Westland Woodpigeon biplane during testing so was selected for production, but before the first production model was built, modifications changed her into the Widgeon III. Constant chord folding wings and plywood fuselage sides were added.

Prototype G-PEBW, powered by a Blackburn Cirrus II engine took to the sky in April of 1927 and was the version that went into production. Construction stopped in 1929 because of contracts for the Wapiti biplane for the Royal Air Force. (A military aircraft contract during that lean between-the-Wars period was something not to be passed up!).

About 30 Widgeons were produced, the last few being the IIIA model with metal fuselages and the divided main undercarriage. In addition to UK, examples went to Australia Canada and Africa. I can only find one example in Australia that is restored and still flying. I like to think of the Widgeon as the grandfather of the Lysander of WWII. The IIIA version is the one we have modelled here.

Construction begins

I always start a model by building the things that I least enjoy doing first. Tails and wings are not my most favourite parts so we will start there. The rudder outline is laminated from three pieces of 1/8"x1/16" strip wood. I make a cardboard outline of the surface using the inside line of the drawing. That way, when you add the laminations around it, the outline will be the proper size. Use a crayon or candle to cover the edge of the cardboard so the glue won't stick.

As much as I love using *Hot Stuff* cyan glue for all my building, I don't on laminated outlines. I wet the strips and let these soak. I then brush on aliphatic glue. I call it yellow white glue. Pretty dumb huh? *(Sounds a fair description to me, works like white glue, but is yellow. PR)* All pieces are coated on one side, then stuck together and wrapped around the form. They are pinned and left to dry. The rudder is the only laminated surface on this model. Once it is dry, clean up the piece with sandpaper and build the rudder.

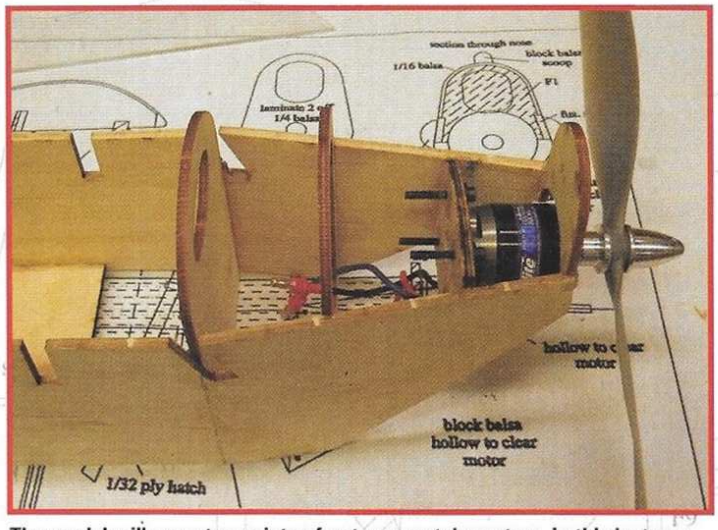
The fin is cut from sheet balsa. Be sure to add the balsa in-fill at the bottom of the rudder. It is the mount for the horn.

The tailplane is straightforward and built from strip wood. Just remember to add the horn mount (as with the rudder) and make the wire joiner before you hinge things, otherwise you will be rigging both elevators separately! Finish-sand both items, then set them aside for now and it's off to the wing.

Wing

The wing is built in three sections. You could make both panels removable from the centre section, or you can build it on one piece as I chose to do. I drive a Pick-Up that can carry models in one piece, so that is how I build them. I am lazy and hate putting models together at the field. Yuck! So the choice is yours.

Nothing is shown to make removable panels, but simple tubes and pins would be suffi-



The model will accept a variety of outrunner style motors, in this instance an E-flite 450.

Rough shaped, and pinned in position, the bits and pieces that make up the nose shape of our little Widgeon.

Front deckings in place and all ready for a bit of sanding smooth.

cient with the struts being used. These would support the wing to a large degree.

The centre section which, on the full size aircraft housed the fuel tank, is built first. The plywood dihedral brace is glued in behind the spar and sticks out both sides of the centre section when done. It will set the dihedral angle for you. If you go for the three-piece arrangement, you would need to fashion a box for it to plug into on the main panels. *(Or omit the brace altogether and use wire dowels and brass tubes to mount the outer panels. PR).*

The top is sheeted with 1/16" balsa. Note that the 1/8"x1/4" pieces up against the outside ribs on the bottom are there to help support the centre section struts when you attach the centre section to the fuselage.

On the main panels, the ailerons are full length and are built separate from the wing. Strip the proper size 1/8" sheet for the false trailing edge. I like to put the spar down first and then use a couple of ribs to space the leading and trailing edges. Once you have them correctly placed, you can add the ribs where they go.

Note that the two inside ribs of each panel are lower, for the sheeting to be added on top. The pieces numbered 'Z' and the wing tips are 1/8" Liteply. The two tip ribs are just blanks that you add and then shape to obtain a smooth slope, down to the tip. I used light ply for the piece that glues to the inboard edge of R4, which is the thick rib for the struts. I like to use blind nuts and screws to mount the struts. You can use the method shown on the plans or come up with your own way.

Build the aileron as a separate piece, then sand and set aside. Do not forget the piece that the horn mounts in and note that the leading edge is a thicker piece than the wings' trailing edge. *(To allow for shaping. PR)*

Plywood plates for mounting the aileron servos are cut from 132" ply. I like to add pieces and frame the plates so they sit flush with the wing. Then I just tape the servo to the plate and tape the plate into the wing after covering - but I am getting ahead of my self a little.

Add the centre top sheeting and sand the panels and ailerons. The R1 rib is notched wider than the others to allow for the brace to slide in behind the spar. Set the dihedral at 1/2 inch under each wing tip and glue her together. I brought the servo leads out by the centre section struts and ran them down the strut into the fuselage. You can use a 'Y'- lead in the wing or bring them out separately. The choice is yours. *(It is possible to disguise the servo lead/s as fuel pipes, running from the c/s tank into the fuselage. PR).*

Sand everything again and make sure you have shaped your leading edges and tip ribs and set your wing aside until you are ready for covering. If you use the laser cut parts I must say that things just fall together. Everything is the right size and it fits. Takes all the work out of building and makes it fun!

Fuselage

OK! Now we get to the part that I like. When my Dad would build a model, he wouldn't stop until he had the fuselage up on the landing gear. At that point he would consider it an aeroplane. Then he would sit and smoke and look at it. I still remember that from my childhood!

Anyway the fuselage is built in standard 'Rake-fashion'. A plywood box front and a squared-up stick rear fuselage. Build the two rear side frames and square them up. Don't forget the two laser cut pieces F10 and F11. The front is squared up using both sides and F3 and F5. There is a balsa doubler that glues to each side between these two formers. Part UC glues on the bottom between the notches.

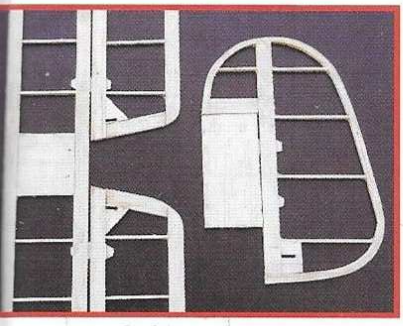
Add the rear to the front and make yourself a fuselage. You can now glue in the two 1/16" balsa cockpit floors, as they will help to square things up.

Cut a scribe line on the fuselage at F3 and crack the sides so you can pull them in and add F2 and F1. (The marking and scoring is probably more accurate if done before joining the sides to the formers. It's certainly easier. PR).

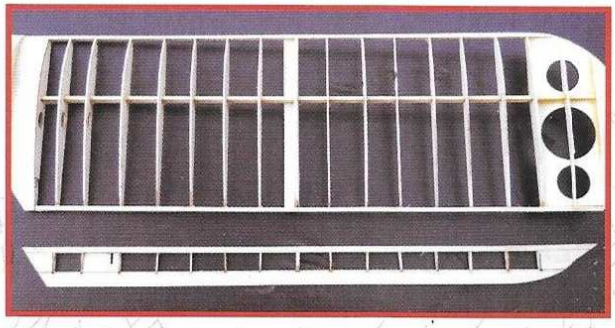
Hold off on part M until you figure out what motor you are going to use. I used an *E-flight 450,* which seemed about right. Mount your motor and then install part M with some right and down thrust. You may have to add or subtract a little from the sides of part M depending on the motor used. *(Unless you use a vastly different motor, the mount position shown is suitable for quite a variety of types. PR).*

Add the F4 formers to the top and sheet it. This takes a little work, but stick with it and you will get it. *(Made a lot easier if the centre section struts are fitted after the decking is in place. PR).*

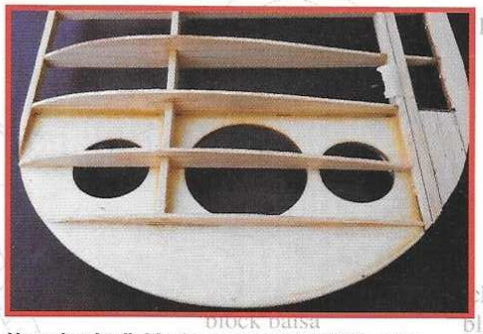
Mark your cockpits and cut them out. F6, F7, F8, and F9 are added to the top of the rear fuselage and sheeted as well. This task was



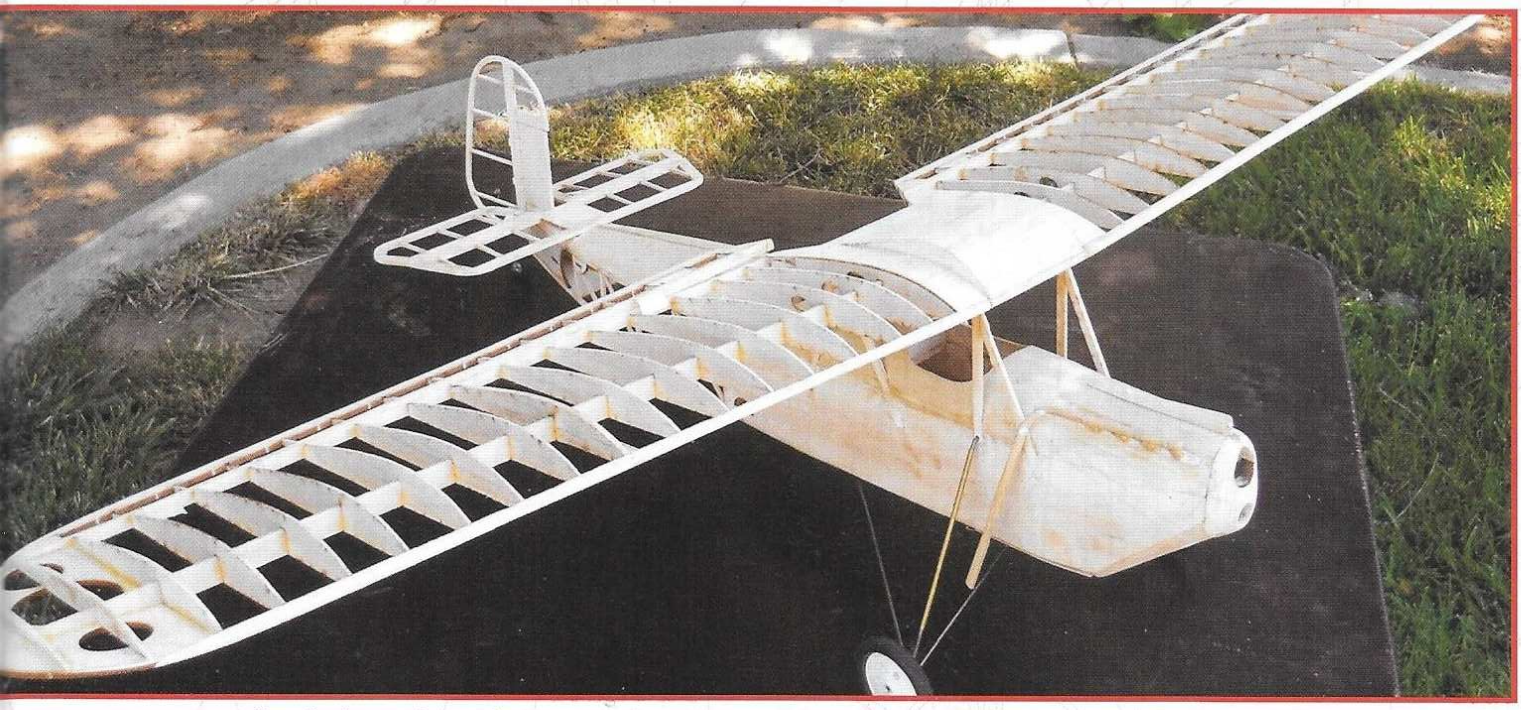
eally is nothing about the tail surfaces to essed about - all very straightforward



Yes, strip ailerons are scale on this model.



How the tip rib blanks are sanded to follow the curve of the covering. Shape in-situ, so you can see when they look right.



You simply must have at least one naked model to an article, so here it is. Simple structure and nice lines make for a very pretty model.

tough for me but I managed to get the rear deck sheeted in two pieces.

Add the block balsa to the front bottom and the nose block and sand those to shape. There are three air intake blocks to shape, one on each side and one on top. I made these from balsa blocks and then fashioned an exhaust system as well. There are two hatches on the bottom, one in front of the landing gear block and one behind it. These are made from 1/32" ply and sized to fit. Add the centre section struts and cut the sheet to fit around them.

The landing gear is a bit tricky, so study it for awhile before you start wasting wire. Brass straps and screws may be used to hold things, meaning the gear will be removable for covering. Add balsa strips to the gear wire to simulate fairings and shocks, or you can leave them plain if you prefer. It doesn't really detract from the finished model if you decide to just leave things bare. The landing gear was by far the hardest part for me, but it turned out fine - just took a little time.

You need to fashion some sort of tailplane mounts from blocks. Sand the fuselage to your satisfaction and decide what you are going to use for covering.

Covering & finishing

I usually cover my models with *Coverlight*. It is strong and light and simulates a fabric finish. This time I chose to try a lightweight film finish and it turned out OK, but was very difficult for me to use and I won't do it again. I covered my fuselage and rudder in red and the wing and tailplane silver. These came out very pretty and look good in the air. Choose what you will, do a good job and you will be happy in the end.

Once every thing is covered, go ahead and glue the tailplane and fin/rudder onto the fuselage. I use cyano type glue here because I want them to pop off rather than break in a crash. I have never had a tail come off by gluing them this way. I used flex hinges that I purchased from *Sig*. These glue in with cyano type glue.

The elevator and rudder both operate from pull-pull cables and I use an item called *Fire Wire* that is used to make jewellery. *(Tiger Tail is a brand available in the UK. PR).* Small cuts of aluminium tube are used to crimp the ends. *(I won't use aluminium crimps, I just think they're too soft. Brass tube crimps and a tiny spot of cyano works well for me. PR).*

For the sake of realism in the air, I installed pilots in both cockpits and made windshields from clear acetate. My wing was permanently glued onto the fuselage. I bolted my wing struts at both ends using brass tabs and 2/56 screws and blind nuts - not the easiest way but one I am used to. Pete's way of cotter pins and loops would work very well I'm sure - I just sort of get stuck in ruts sometimes. *(Whilst Marion's strut mounting are very secure, and vital if you opt for removable wing panels, the linked split-pin system works well when you leave things assembled, especially so on a model like this where the struts are little more than cosmetic. PR).* I forgot to mention the struts, which are cut and fashioned from 3/16" thick Basswood. Rather than cover them I chose to paint them and the intake blocks as well.

My finished model weighed 22 ounces, which I felt was very light for me - everything I build tends to come out heavy.

A speed control from *Electrifly* at 25 amps is what I used, and I squeezed a 1300 mAh, three-cell pack in behind the firewall. My flight test flights, at half throttle, were easily 15 minutes. So now we have a finished Widgeon and its time to go fly.

Flying & dying

My Widgeon flew right off the board. I added a half-ounce of nose weight because she was just a shade tail heavy. Flight times were easily 15 minutes. She would cruise around very nicely at half throttle and take-off and landings are non-issues. The Widgeon is not a beginners' aeroplane, but I would recommend her as a second model.

Loops, Rolls, Split-s and other manoeuvres are no problem. The Widgeon is a complete joy to fly and looks good putting around and shooting touch and goes.

Now for the sad part. I had put probably ten flights or so on her and was just getting to where I felt comfortable and was enjoying flying my Widgeon. I was just cruising around the sky when this huge Extra 260 something just flew right through me. My poor Widgeon was mortally wounded and she spun in with a folded wing and quite a bit of damage everywhere else. Hitting the ground didn't help any either. The Extra fared better and he made it back, but also had quite a bit of damage to one wing panel. *(Plenty good enough. PR).* My poor Widgeon is put to one side and will be rebuilt at some point.

If you want something a little different, I would highly recommend the Widgeon for your flying pleasure. After all she is almost a Lysander and I love Lysanders. Thanks for listening to me ramble-along. ■