

PHOTOGRAPHY: TOM ARNOLD

Once upon a time, the He 219 *Owl* prowled the night skies of WW II and wrought havoc with Allied night bombers. The author reproduced this Luftwaffe twin in jumbo size, spanning 30 inches.

Heinkel He-219 "UHU"

By Tom Arnold

Scourge of the German skies in WW II, this jumbo F/F scale model of the night fighter can be the source of FAC events.

It had to have been an adrenaline-filled night. Young Luftwaffe Major Werner Streib had lifted off the darkened airfield at the height of the RAF night bombing blitz. Flying the newest, most deadly nightfighter that the Third Reich had produced, he turned the nose of the insect-like twin engine hunter in an upward bank towards the British bomber stream unseen above him in the starlit black sky. For two hours, the Major and his radar operator glided unseen into and out of the ponderous bomber stream of *Lancasters*. Playing a deadly game of nerves, they slowly crept below the tail of the explosive-laden giants knowing full well that should their dappled gray aircraft be seen by an alert tailgunner, a storm of machine gun bullets would crash through the clear canopy to end the hunt.

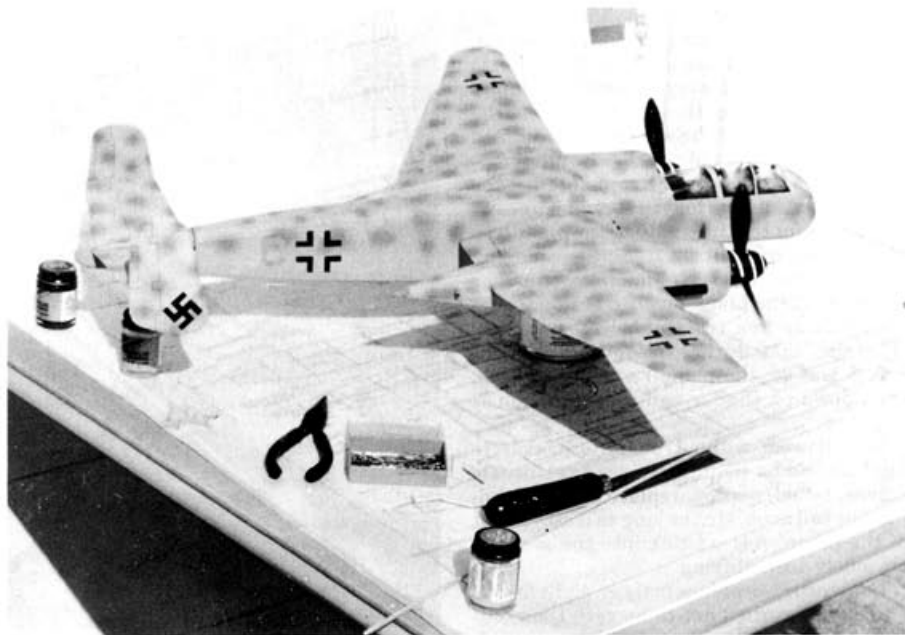
Sighting through the dimly lighted gunsight over his head, Streib moved the nightfighter gently back and forth and it was the bombers that received a stream of explosive shells into their bellies instead, to end in terrifying explosions and orange fireballs. The new nightfighter and its crew downed five bombers before turning back to its home field, doing in two hours what some crews took a whole war to do. As the aircraft

dropped quickly on its final turn to line up with the runway lights, some gremlin in the new machine jammed the flaps. The 9-ton fighter dropped suddenly and slammed into the runway with a teethjarring bang and careened off the pavement into the grass. At a speed close to flying, the big aircraft turned slightly sideways and with the metallic snap of a landing gear, the nose was smashed to the ground.

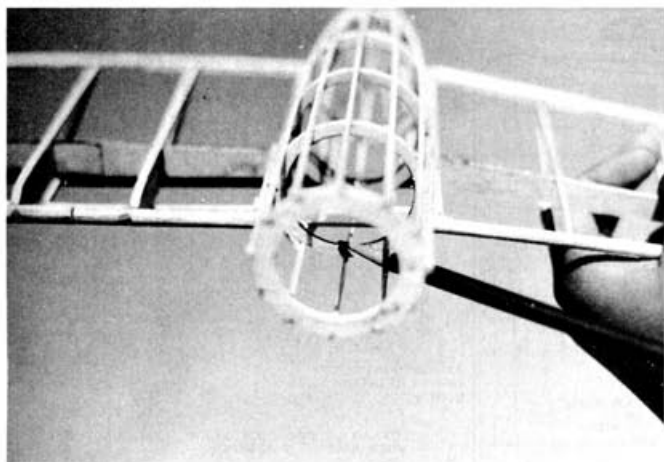
As the completely severed cockpit section skidded on its side across the pavement, the remainder of the aircraft dug into the ground and broke its back and wing as it plowed to a stop—a complete wreck. In the long painful silence that followed, the Major and his radar operator realized they were bruised, shocked, and alive with the cold ground on one side of the canopy and the black night sky on the other. The opinion, at that moment, of Unteroffizier Fischer of ham-fisted officer pilots has forever been lost to history but we can be sure it was colorful.

In spite of the spectacular end of the first combat trial of the Heinkel He 219, the Luftwaffe brass awaiting the results of its night baptism were impressed enough to order the *Uhu* or *Owl* into production. Designed to carry the early bulky and heavy radar intercept gear, the He 219 sprouted a forest of antennae on its nose, and carried some of the heaviest armament in the sky in the form of eight cannons, including the effective "Schrage Musik" installation. Forced the indignity of flying backwards, the enlisted radar operator had no less than four radar screens in the later models to guide the pilot to visual range of a target.

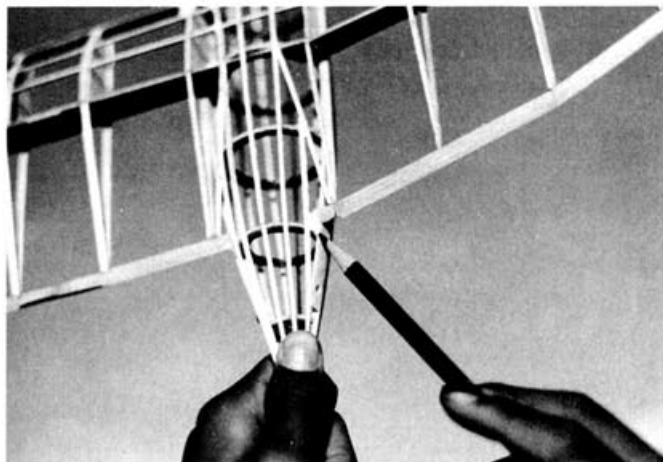
Equipped with compressed air powered ejection seats, heavy firepower, the latest in electronics, new tactics, and special camouflage, the He 219 was truly the stealth fighter of its time. There was no controversy over its effectiveness by the aircrews. In fact, it was wanted so badly, complete airframes were constructed out of spare parts! Like today's new aircraft, politics and bureaucrats strangled all-out production and the big night fighter got to the front line units in "teasing



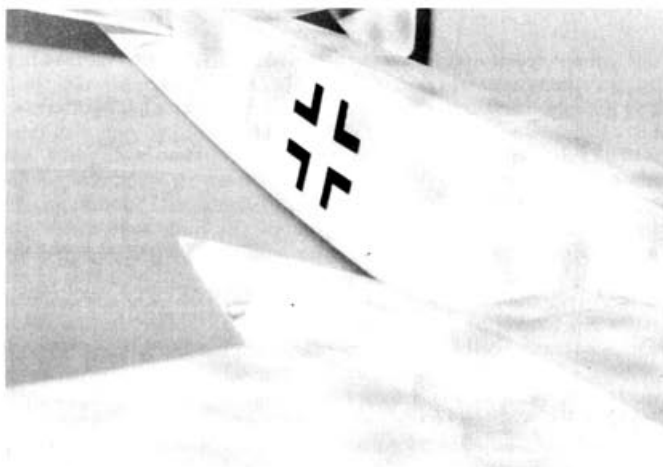
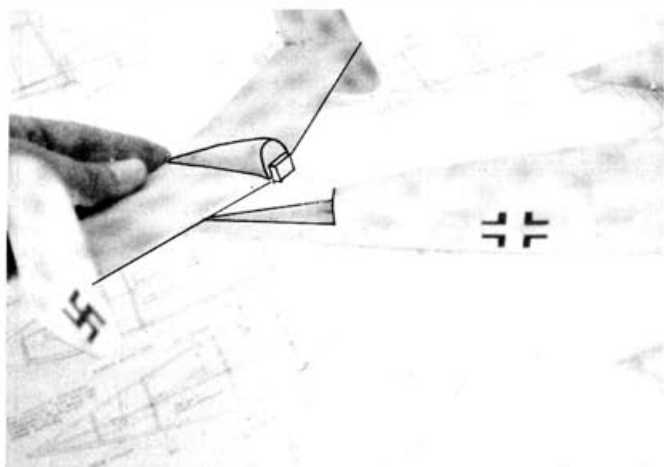
Biggest challenge designing any twin is a suitable length for the nacelles. In this respect, the Heinkel offers a pretty adequate size, with a choice of a long and a short nacelle version.



Carbon fiber plays an important part in the *Uhu* construction and the pencil (above left) points to the thin strip that line the inside circumference of the nacelle former. The pencil moves the rear of the nacelle (above right) and



points to the tissue anchor gusset. An index key on the stab helps line it up for the rear fuselage saddle (below left). A few simple tissue markings neatly done like the yellow "C" (below right) don't overwhelm the model. Adds brightness.



dribblets" as General Kamhuber, commander of the night fighters, put it. Those dribblets wreaked fearsome damage in the RAF bomber streams but even they could not stop the Allied onslaught and they ended the war for the most part, literally, out of gas.

On to the model

To the delight of twin rubber scale enthusiasts 45 years later, the He 219 in all its forms still gets the adrenaline pumping in its aircrew. The *Uhu* has that ominous Teutonic look about it that appealed to the author immediately and, after three models of it, it still looks fearsome in a tight climb hunting for a *Lancaster* overhead. The versions available are pretty intriguing and for the Flying Aces events, the versions that never flew are perfectly legal.

The biggest challenge of any twin is getting the longest nacelle possible for a rubber motor. The He 219 has a fair size in the short nacelle (the DB603 engine) with its only drawback the wing spar passing through the rubber motor area. The long nacelle (Jumo 222) was mated to only one example of the *Uhu* with a standard wing and for those building that version, no photos exist of it but it was coded KZ+RZ and probably sported the standard dappled gray paint scheme. Another version was the B-2 which was a short nacelled/long span aircraft designed to hunt the British nightfighter *Mosquitos*. The final model (the B-3) was the long span/long nacelle version which never flew as it was de-

stroyed in a hangar by Allied bombs as it awaited the new Jumo 222 engines. Needless to say, this last version would be the best of the flyers for rubber power. Whatever you pick, they all fly best in moonlight!

One of the challenges of this twin is the location of the wing spar. It very inconveniently goes right where the rubber motor passes. An experiment, which was a great success, was the careful use of carbon fiber to allow the spar to be cut away and yet retain its strength. Carbon fiber always seemed a bit high tech (and high expense) for a traditional balsa wood and tissue man as myself and I always felt somehow I was cheating if I were to use it. After experiencing the results, I think I'll cheat a lot from now on. Carbon fiber stripped in thin $\frac{1}{16}$ to $\frac{1}{32}$ strips can save grief, repairs and make a lot of impossible designs possible. Its main strength is in tension and compression (to a slightly lesser degree) and by CyA'ing a strip to the top face of the wing spar and then to the bottom, including the cut-out area, the spar becomes surprisingly rigid.

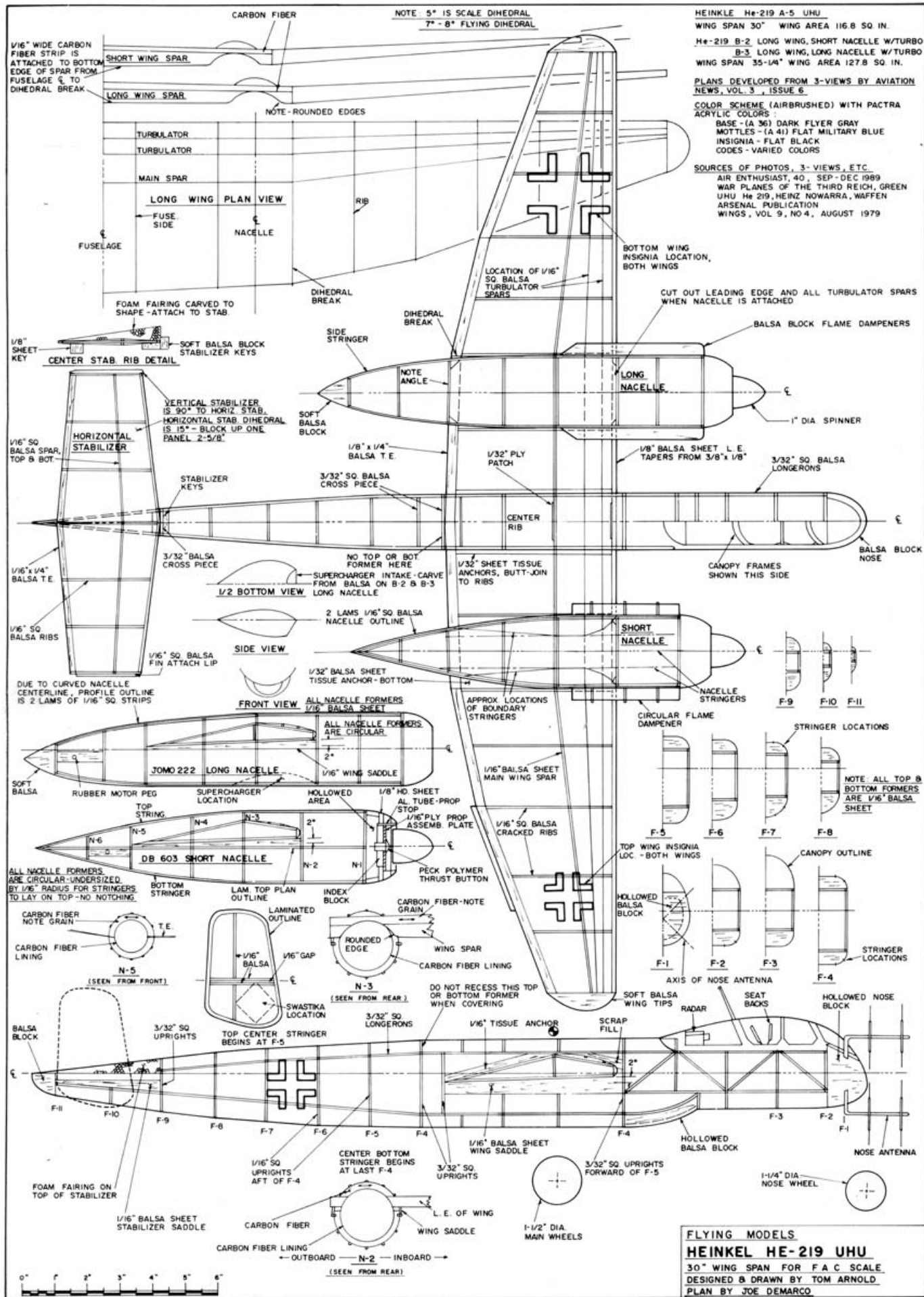
The best way to see this is to glue up some test pieces and break them with your hands—the results are amazing. You will quickly start seeing places to use these black whiskers. By the way, do not get carbon fiber confused with boron fiber. Boron fiber is bad stuff, dangerous to handle, frays and shatters and some awful stories go around as to the health hazards. Carbon fiber comes bonded to a matrix that does not allow splin-

tering or whiskers to pop loose to stab you. It will break but to tell you the truth, razor blades and dope fumes have done more damage to my body than carbon fiber ever could. Just use some common sense in working with it. To get a nice $\frac{1}{16}$ -inch strip, just nick the edge and peel up a strip. It comes off quite cleanly and even. Lay it down and hit it with CyA or Titebond. You can cut it but be aware that it dulls razors and scissors quickly. I used industrial scissors for shapes other than strips.

Putting wings on the bird

Let's get started on the wings. Cut the spar to shape, including the cutout for the nacelle, and put in the dihedral break. Note the spar also angles forward from that point. Face the joint with a patch of $\frac{1}{32}$ plywood, cracked appropriately, and soak it with thin CyA glue. With a bit of work, a carbon fiber patch can also be used. Peel off a $\frac{1}{16}$ -inch wide strip from your sheet of carbon fiber and CyA it to the top and bottom edges of the spar from the root rib out to the dihedral break. Theoretically that should be sufficient, but the stuff is so light I gave myself a bit of insurance and laid a $\frac{3}{16}$ -inch strip along the face of the spar at the narrow point too.

Turn now to pinning down the leading and trailing edges of one of the inside wing panels. Lay down and glue the $\frac{1}{16}$ square rib bottoms, then add the spar and finally, the top rib pieces. Add a $\frac{1}{16}$ -inch sheet balsa rectangle to the top of the forward rib pieces



HEINKLE He-219 A-5 UHU
 WING SPAN 30" WING AREA 116.8 SQ. IN.
 He-219 B-2 LONG WING, SHORT NACELLE W/TURBO
 B-3 LONG WING, LONG NACELLE W/TURBO
 WING SPAN 35-1/4" WING AREA 127.8 SQ. IN.

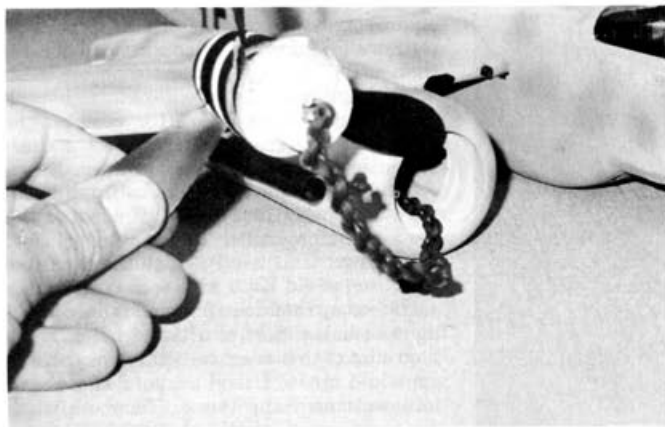
PLANS DEVELOPED FROM 3-VIEWS BY AVIATION NEWS, VOL. 3, ISSUE 6

COLOR SCHEME (AIRBRUSHED) WITH PACTRA ACRYLIC COLORS:
 BASE - (A 96) DARK FLYER GRAY
 MOTTLES - (A 41) FLAT MILITARY BLUE
 INSIGNIA - FLAT BLACK
 CODES - VARIED COLORS

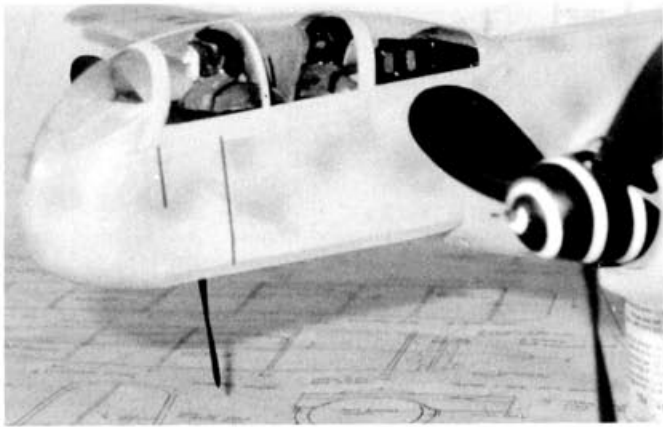
SOURCES OF PHOTOS, 3-VIEWS, ETC.
 AIR ENTHUSIAST, 40, SEP-DEC 1989
 WAR PLANES OF THE THIRD REICH, GREEN
 UHU He 219, HEINZ NOWARRA, WAFFEN ARSENAL PUBLICATION
 WINGS, VOL. 9, NO. 4, AUGUST 1979

FLYING MODELS
HEINKEL HE-219 UHU
 30" WING SPAN FOR F A C SCALE
 DESIGNED & DRAWN BY TOM ARNOLD
 PLAN BY JOE DEMARCO

He-219 "UHU"



Note the notch in the nose block. It accommodates the aluminum tube set just inside the right side of the cowl (above left). A wire into this tube locks the



wound-up prop, so the other can be wound. What would a night fighter be without radar (above right), so check out the model's back cockpit.

and sand them to create a smooth airfoil. Add the $\frac{1}{16}$ square turbulator spars. This same process is repeated for the outer wing panels but with a slight change. After pinning down and gluing the leading and trailing edges and the bottom rib pieces, shim up the rear of the wing tip rib to give a 2' washout. Now add the spar (and completed inside panel) and the top rib pieces, turbulator spars and such.

What we want is for the washout to be built into the structure and to not rely on the fickle strength of the tissue covering to hold it during the heat and humidity of the flying field. If, for some reason, the framework refuses to hold the washout, unpin the structure and soak it for an hour in the bathtub with a few shots of liquid dishwashing detergent added. Carefully repin it and re-shim the washout and let dry thoroughly. If necessary, add some $\frac{1}{16}$ square cross braces diagonally across the rib bays to help hold it. This may sound like a lot of work, but it's cheap insurance for the rest of your efforts, believe me. Finish the wing with a final sanding including sanding the forward rib tops flat between the turbulator spars.

As long as we are on wings, let's go to the tail. Cut out a laminating form from $\frac{1}{8}$ -inch sheet, also $\frac{1}{8}$ inch undersize of the vertical stabilizers. Laminate the outline from four strips of $\frac{1}{32}$ -inch sheet soaked in Titebond and let dry. Pop loose from the form (you did wax it, didn't you?) and slip in the $\frac{1}{16}$ -inch sheet scrap as a spacer between the two while the glue sets. Add the remaining ribs and sand the whole thing to a smooth airfoil shape, leaving the "inside" flat. This will allow the vertical surface to mate evenly with the horizontal stabilizer.

The horizontal stabilizer is pretty straight forward. Pin down and glue the outside edges and ribs including the $\frac{1}{16}$ -inch sheet lip that the vertical stabilizers will slide on. Note the grain direction. Now lay the top spar down and glue into place. Unpin and flip over and attach the bottom spar. Fill in the ends with short strips of $\frac{1}{16}$ -inch such that the tissue will lay smooth and have anchors at both ends. The airfoil of the stabilizer becomes really an elongated diamond and the purpose of this is to ward off the tissue induced warps of a "flat plate" type tail surface. Sand to shape, glue in the dihedral, and lay aside. Remember the center rib needs the tissue anchors also.

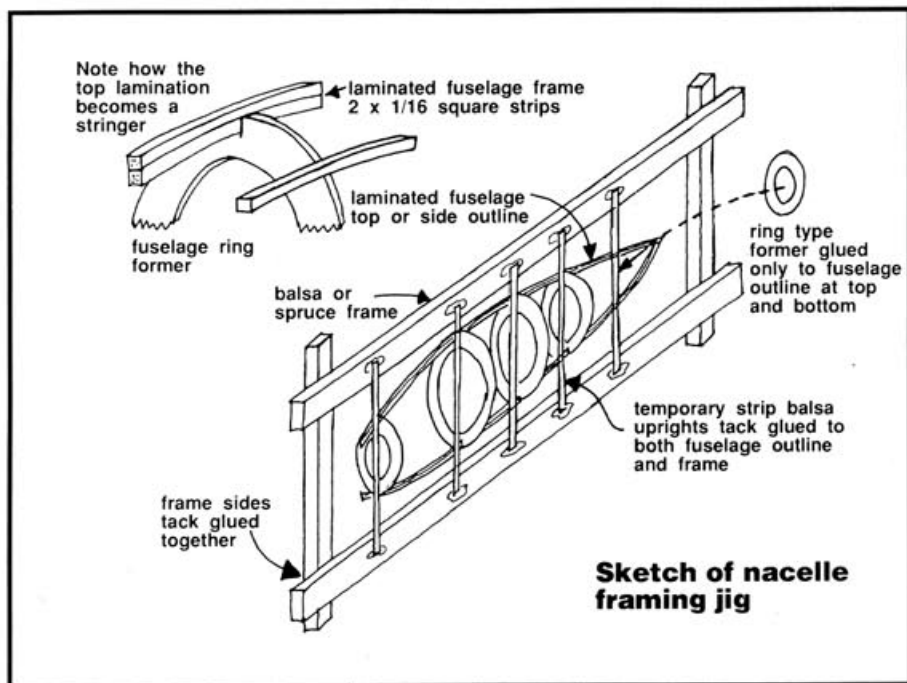
The fuselage: a standard affair

The fuselage starts out as your standard box affair with quarter formers glued top and bottom. The best advice I can give here is to take your time and make sure it's dead straight. The fuselage is so long and narrow, you'll never be able to hide the famous "banana effect" if it's not! Curve and hollow the front of the belly armament pan and attach into place. Add the stringers all around without thought to the fact that the wing has yet to be mated to the fuselage. We will cut away the stringers and carefully glue them back later. What we want to do is keep the fuselage straight for now and besides, it's an awfully lot easier to cover without the wing in place.

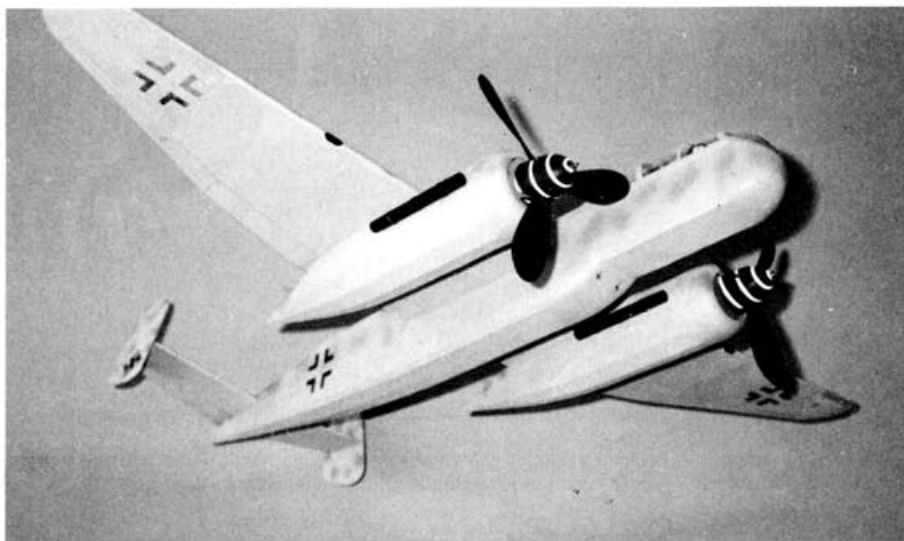
Go down to your friendly balsa emporium and buy some of that fine white balsa wood in block form. I realize that it rivals the price of gold but it's time for that favorite activity of young and old—canopy carving. Not only will we carve the canopy, but we will also carve the nose block at the same time to avoid an unsightly mismatch later on. Spot glue the blocks together such that when they are

finished you can pop them apart, gluing the nose into place on the fuselage and using the canopy section for molding acetate. As you carve, trial fit this whole nose/canopy to the fuselage frame to ensure it all blends and fits. After putting that final exquisite, smooth, satin finish with progressively finer grades of sandpaper, carefully cut the nose loose and hollow out as shown. Glue $\frac{1}{16}$ -inch balsa sheet backing to the noseblock and attach it to the fuselage. This now will give you a cavity to put some BB's in should you need noseweight later during the flying stage. An $\frac{1}{8}$ -inch hole, drilled in the bottom of the nose, will give you access and be easy to seal up unobtrusively.

The nacelles are built using a method that I must give credit to Don Srull of the DC Maxcutters for. At the last FAC Nats, during a late night bull session, Don shared his experiences using carbon fiber and I instantly pirated his great ideas for the He 219. The concept is that by lining the inner edge of a fuselage former with a $\frac{1}{16}$ -inch strip of carbon fiber, you can get a very narrow and



He-219 "UHU"



Some soft balsa block will be needed for areas like the front area of the twin cannon belly tray, the engine exhaust flame dampeners, and the nose of the fuselage. Of course, they all need to be hollowed judiciously.

tremendously strong former. He was able to get formers down to $\frac{1}{8}$ to $\frac{3}{16}$ -inch deep and still hold plenty of rigidity depending on the size. While the weight saved is dependent on the glue used and former size, it does give a great open area within a fuselage to contain a flailing rubber motor.

With that in mind, the nacelles are a perfect place to use this ingenious technique. As a first step, the formers were drawn with a ballpoint pen on pieces of light $\frac{1}{16}$ -inch sheet. The next step was to cut out the centers only and then line them with strips of carbon fiber attached with CyA glue. The easiest way to do all this is to pin the former down over a sheet of wax paper prior to lining it with carbon fiber. The fiber is pretty springy and it helps to rub and hold it in place with small patches of wax paper to keep your fingers from getting stuck during the process. When the CyA has set, cut the outside outline and you have it done for the formers.

Be aware that the circular formers are undersized $\frac{1}{16}$ -inch of the actual radius to allow you to lay the stringers in place without that maddening process of cutting notches in the formers. The author uses a handy little compass type cutter made by "Olfa" that can be found in sewing shops. After lining the centers of the formers, the center cutouts were replaced to allow the Olfa cutter to be centered and then the outside was cut.

Now for a technique pirated from Stew Meyers (another Maxecuter) that the author uses for all former type structures like fuselages and nacelles. In this case, a hard balsa framework is spot glued together into a "picture frame" a bit larger and longer than the finished nacelle. (My framework is made up of hard $\frac{1}{4} \times 3 \times 24$ -inch strips and I reglue it to fit whatever size fuselage/nacelle I'm building). Over the top view of the nacelle, pin down two strips of $\frac{1}{16}$ -inch square over the plan view outline and laminate together with thin CyA to form a crutch. This looks similar to the beginning of the half-shell-and-former method. Now cut a number of strips of $\frac{1}{16}$ -inch scrap sheet approximately $\frac{1}{4}$ inch wide and long enough to bridge the inside of the "picture frame." Lay these strips at reg-

ular intervals parallel to the former locations all along the nacelle outline and spot glue in place. Before unpinning the frame work, carefully nick out a small $\frac{1}{16}$ -inch gap on only the *inner* strip of the nacelle profile at each of the former locations. Now you should have a rather floppy, bendy affair that you lay over the opening of the "picture frame" and glue into place.

You can see what you have is an external jig that holds the nacelle top profile rigid while you slip the formers into place and lay the stringers up. When the nacelle is stringered, a few deft cuts to the holding strips on the "picture frame" will free the nacelle. Now cut away the holding strips from the nacelle frame and viola! No warps!

After all that, let me mention to add only the stringers to the bottom half of the nacelles in the jig as the top ones will be added when the nacelles are mated to the wings. If you are planning on building the long nacelled version, notice that we still use the same "picture frame" external jig but it's the side profile outline that is laminated now. This is because the center points of the circular formers do not lay on the center line towards the aft end. I found this phenomenon out the hard way!

Cover the bottom of the wings at this point (don't shrink the tissue yet) and cut the tissue out of the area where the nacelles meet. Slip the nacelles up from the bottom and, if all is done right, nacelle former N3 will lay against the spar and N2 will touch the leading edge. Glue everything together being sure that you have the correct angle of incidence between the nacelle and the wing. Glue the opposite nacelle on and sight to make sure that both are exactly parallel.

The top stringers are added to the nacelles and a bit of forethought as to how the wing top surface will intersect the nacelle will be needed to lay the "boundary stringer" between the two. The positions shown on the plan are approximate as your mating job will be slightly different than mine. The main thing is you want the top wing surface tissue to lay smoothly up to that "boundary stringer" and the nacelle tissue to meet it

equally smoothly. This is possible because the nacelle and wing surfaces meet at greater than a 90° angle and the tissue on those surfaces grab on easily to a common boundary stringer. Such is not the case on the underside of the wing and some $\frac{1}{32}$ sheet tissue anchors will probably be needed.

Sand the whole affair and as final touch, get some rather amazing stuff down at the hardware store called "Red Devil One-Time Spackling." This stuff is not the rock-like spackling of old but a high tech stuff that is a white goop that dries fast and is as soft and light as balsa. Sort of a liquid balsa wood. Slop a bit of this at crucial junctions to fill in gaps and create tissue anchors at stringer intersections. Sand the stuff smooth when dry and tissue cover the top of the wing.

Before covering the nacelles we need some cowls in place. Cut to a rough oversized circle the sheets of balsa that make up the cowls. Laminate them together but leave glue off the circular area, both front and back, on the $\frac{1}{8}$ -inch sheet equal to the area of the cowl opening. The reason is that we are going to turn the cowl to its final shape on a Moto-Tool and we will cut out the interior down to the $\frac{1}{8}$ -inch sheet. With no glue on that area, the scrap will fall right out. Mark the exact center of the laminated balsa disc, drill an $\frac{1}{8}$ -inch hole at that point and CyA in an $\frac{1}{8}$ -inch rod (or brass tubing) to serve as a mandrel. Make sure the rod sticks out an equal amount both front and back. Mount the mandrel in a Moto-Tool and sand the cowl gently to shape at the low speed setting. When you have graduated down to a smooth finish with 400 grit sandpaper, fold a piece of 60-100 grit and use it like a knife to sand a channel down through the front to that unglued area of the $\frac{1}{8}$ -inch sheet lamination. Clean the lip of the cowl up and when finished, flip the mandrel over and re-chuck so the back faces outwards. Do the same thing to the back only now the object is to sand away excess weight and hollow the back of the cowl down to that $\frac{1}{8}$ -inch sheet again.

Let me urge you strongly: *do not* attempt to use an X-Acto knife to cut these areas out. It's very dangerous as the balsa will catch that blade point and flip it into your face or leg in the blink of an eye. It's over before you can even move. Besides—it doesn't work! All it will do is chew up the balsa wood anyway. Sandpaper will work wonders and go as fast as anything. Just keep refolding it to keep fresh grit against the wood and you can put any shape you want in that wood. It's a good idea to continually fit the cowl against the nacelle as you are going through the shaping step to insure there is a smooth blend between the two. When the cowl has arrived at its final shape, go through your favorite grain sealing process and just chuck it back in the Moto-Tool each time you want to sand the surface.

When the cowl is shaped, sealed and ready for mating to the nacelle, twist out the mandrel and cut out the opening for the prop assembly to fit. Glue the cowl to the nacelle and make sure all your stringers end evenly with the outside edge of the cowl. Cover the nacelles with tissue, shrink the whole wing with a spray of rubbing alcohol, and seal with a coat of 50/50 dope.

As long as you are covering, do the fuselage sides and bottoms but leave the top open.

Time to mate the wing and fuselage by carefully cutting all the stringers and the fuselage top longerons directly over the wing leading and trailing edges. It will be easier to reglue them if the cuts are at an acute angle rather than straight across the longerons/stringers. Carefully lower the wing into place and glue at the correct incidence angle. Again, sight to make sure the nacelles are parallel to, now, the fuselage. Replace and reglue the cut stringer and longeron assembly. Isn't it nice how it all came out in one piece? Fill in any gaps with scrap balsa.

Finishing covering the top of the fuselage and wind up with the horizontal tail surfaces if you haven't done them by now. Take the horizontal stabilizer and place it into position on its saddle at the tail. Carve, sand and cover with tissue a styrofoam fairing and attach at the center of the stabilizer. The horizontal stabilizer will be tilted up in its entirety up for final trimming, so a soft balsa index block is glued to the front of the fairing to fit into former F9. A sub-rudder is attached at the rear bottom of the center rib that keeps the back end aligned and for initial trimming, the whole affair is held by a rubber band and shimmed up with wood strips. Glue in place whenever you reach that magic angle at the flying field. The vertical stabilizers are slipped on to the 1/16-inch lip at the ends of the horizontal stabilizer and glued into place—you did remember to take out those spacers in the rudders, didn't you?

Finishing is always fun but don't be in a hurry as your efforts here are sometimes a lot more noticeable than that great job you did inside all those nice drum-tight tissue surfaces. The author is a believer that a few well executed outside details will beat a lot of average detailing any time. The He 219 paint scheme is pretty simple to replicate and I picked a version with a dash of color in the yellow aircraft code and the spiral spinner design. Those two items and the cockpit interior was what I was going to stake my visual appeal on. The paint scheme was airbrushed on with Pactra Acrylic Flat Dark Flyer Gray #A41 as the base color and Flat Military Blue #A36 (really a blue gray) for the mottles. These colors are as close as I can determine to be the nightfighter hues.

The mottle is actually a lot of fun to put on—you can't mess up with overspray on this one. Keep it subtle, though. The crosses, swastikas, and aircraft codes are painted tissue, cut out, and attached with diluted white glue. The flame dampers are two layers of drawing vellum wrapped around a waxed dowel, soaked with thin CyA, cut to length and pulled off and painted.

That nifty spiral pattern on the spinners just about whipped me, though. After sealing and painting the spinners and while they were still on the mandrel, I struggled with numerous techniques to reproduce that nice even coil found in the photos. The only thing I found to work was some Carl Goldberg thin vinyl striping tape that had the necessary stretchability to do the job. Hollowing the spinners and mounting them over some Peck 6-inch blades epoxied together around an aluminum tubing shaft is next. The propeller assembly mounted on a 1/16-inch plywood plate, and a simple ramp type free wheeler from brass tubing are slipped on the end of the tubing shaft and CyA'ed into place.

Last not not least was the cockpit area. Anything you can do in this area will instantly give you a lead on your competition when it comes to scale judging. Because so few fellows do any of it, even the most rudimentary cockpit detailing will flatter your model far out of proportion to the extra couple of evenings it takes. I had a couple of vacuformed pilot busts and with a styrofoam block radar set, some paper radar screen hoods and balsa seat backs, I filled up that long empty canopy. It's truly not much but, here's the secret, it suggests so much more to the observer that his mind will fill in details that don't exist. Try it and see if even you don't like your model more!

The canopy itself was stretch formed but because of its length, was done in two sections—the windshield and the aft canopy. My method on this, of course, starts with a smooth canopy mold. Prior to starting the stretch molding process, add about an 1/8 to 3/16-inch sheet base to the bottom of the canopy mold and sand it smooth to blend in with the sides. You want to cut the canopy actually about 1/8 inch longer than it actually is to give you a slight overlap to glue to the fuselage sides. Do not try to seal the mold with sanding sealer, or any lacquer product as the heat from the acetate will melt it and scar the canopy. I've gotten away with a bare balsa finish but prefer to use a heat proof product like Hobbyxoxo Grain Filler if I can.

After cutting a piece of acetate well over-size to cover the canopy, the two long sides are sandwiched between a couple of 1/4 x 1 x 12-inch strips of hard balsa "nailed" together with T-head pins every inch or so. A trusty helper holds the bottom of the dowel the mold is mounted on vertically on the counter top next to the stove. You pull on a pair of heavy gloves and hold the acetate over the burner by the balsa strips. When the sheet begins to fume and go floppy, you immediately move it over the mold and quickly stretch it down and around it. If you botch it, just hold the sheet back over the burner and try again. The

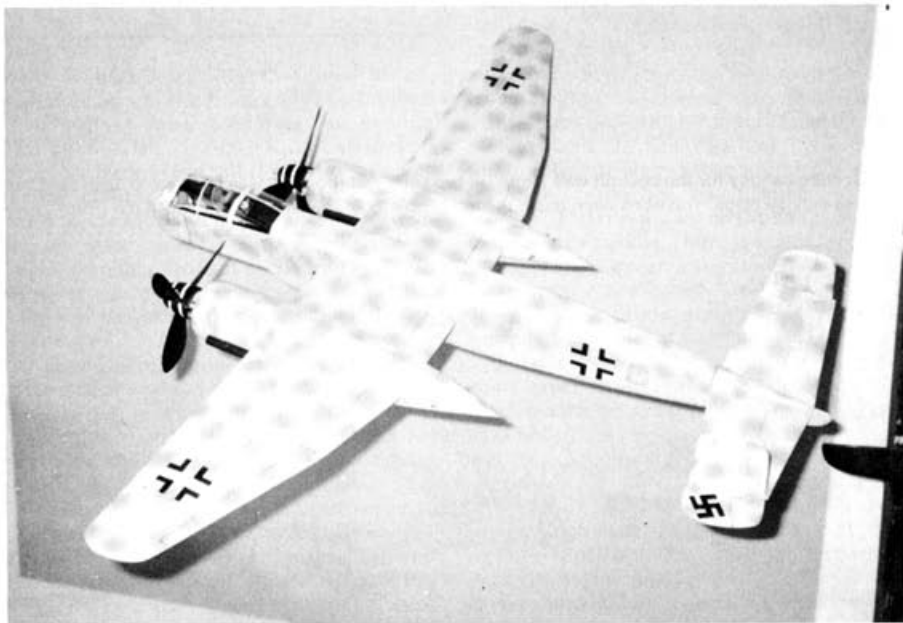
whole process takes five minutes and requires no exotic frames, jigs, vacuforms, gluing, heat guns or whatever I've seen advocated before.

In this case, we pull two canopies—one aimed at the windshield area and one aft of that. The aft canopy is placed back on the mold and is marked to be cut where the forward canopy bow is. The position of the canopy bow had been previously marked on the mold itself. The excess plastic is now cut off and the canopy is again placed back on the mold. Now the forward windshield is placed on the mold and is marked at the canopy bow also with about a 1/16-inch overlap of the aft canopy. After the excess plastic has been trimmed off of it, put it carefully back on the mold and, using a toothpick, put a small drop of thin CyA at the junction of the two canopies. Capillary action will do its thing and you will have a glue strengthened overlap to help form a rigid canopy.

Install the finished canopy on the model with a sparingly used bead of R/C-56 glue along just the bottom edge of the sides. A couple of strips of drafting tape running vertically down both sides of the canopy will hold it to the fuselage until the R/C-56 dries. Framing is quite simple as it is just strips of painted tissue attached with thinned white glue. It will look neater if you attach the left-to-right framing strips before the fore-and-aft strips. The strips are also laid over the bottom edge of the canopy where it is glued to the fuselage. Don't bother with the front windshield edge as it should lay just fine.

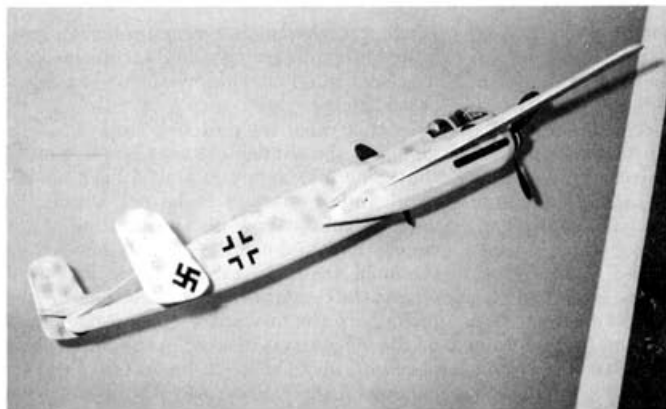
The bright blue yonder

Flying is where all the sins of omission and commission come back to haunt you, but the He 219 won't hold any surprises if you've built straight and, very important, light. Balance the aircraft fore and aft as usual but also take the time to see if one wing is heavy. Head for the legendary tall grass for the hand glides to determine the correct elevator

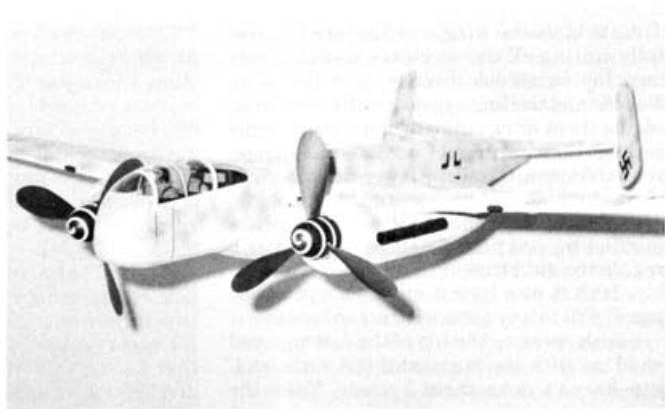


Pactra model acrylic paints worked well for painting the He 219. Only two colors were needed, #A41 Flat Dark Flyer Gray for the basic color coat, and #A36 Flat Military Blue for the mottles.

He-219 "UHU"



The rubber motor peg is an aluminum tube that goes through a hole at the very rear of the nacelle (above left). For a little extra detail, the spinners got the



spiral treatment (above right). These, plus the cockpit detail, and the yellow "C" on the fuselage are, the author feels, the appropriate amount of detail.

angle. If rudder trim is needed, rubber cement on a clear acetate trim tab and tweak as needed. Power trim should start off with a couple of degrees downthrust and put in even an extra degree or so on the right prop thrustline to counteract torque. Wind the right nacelle first and slip a 1/16-inch wire in the prop stop tubing to hold it while the left

is being wound.

Hold the props underneath the fuselage with spread fingers and launch with the other hand. Other than that, trimming is pretty much like a single engine model. I use thrust adjustments to cure turns under power and, if I am forced to use an aileron tab, I rubber cement one to the high wing and

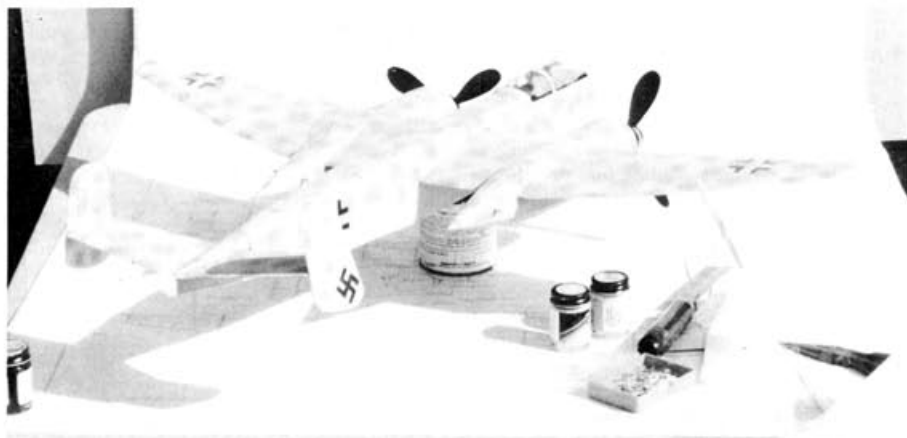
bend it up. This keeps the tip washout intact such that the center of the wing stalls first and the aircraft mushes straight ahead. If a tab were put on the low wing and bent down, the washout is nullified and that wing will now stall first with a subsequent wing drop and roll into the hard ground.

Keep your turns close to equal in both nacelles and work your way up to full winds slowly by increments of 150 to keep the excess power in control. For a more detailed look at trimming and twins in general, see *FM's* back issues of August '89 and September '89. For those who are looking to lighten the structure, here are some suggestions:

- A. Make the tail surfaces out of 3/32-inch square or 1/16-inch square strips with no top spars.
 - B. Build the curved cowl from curved fore and aft formers spaced radially and covered with tissue rather than carved and hollowed balsa.
 - C. Lighten the propeller assembly with hard 1/16-inch balsa replacing the plywood and carved balsa 2 bladed props instead of plastic props.
 - D. Cut away the center of the fuselage formers down to the cross braces after the stringers are in place.
 - E. Eliminate the 4 fuselage corner stringers.
 - F. Narrow the wing saddles.
- Achtung! The *Lancasters* are flying—don't let them get away!



The acetate canopy for the cockpit was formed in two sections (above). It was first heated, then stretched over the canopy plugs. You won't need much more than the tools shown (below) to build the *Uhu*.



Photos, Markings, and Information Sources

- Aviation News*, "Heinkel He 219," Vol. 3, Issue 6, Centerfold (this was the 3-view used to develop the plans).
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