Lockheed's C-130 Hercules

The "Herkey Bird" has long been a favorite with modelers. Here's an opportunity to own one yourself/**Dick Sarpolus**

PHOTOGRAPHY: DICK SARPOLUS

The Lockheed C-130 Hercules must be one of the most easily recognized aircraft in the world; with it's fat fuselage, stubby nose section, high wings, four turbo-prop engines and large vertical fin, it is not easily mistaken for anything else. The Hercules has been around for a long time and shows no signs of getting old; This is a real tribute to Lockheed's technical design skills. It was originally designed to meet an Air Force specification issued in 1951, and has since been built in a bewildering variety of styles, including a strictly commercial version. As of 1979, more than 1500 aircraft of all versions have been built by Lockheed. It looks as if the future holds even more Hercules variations. Lockheed is now working on the L-400 commercial twin engined Hercules, and designs for a stretched fuselage and even a pure jet powered variant exist down in Marietta, Georgia, Lockheed's home plant.

The United States Air Force has more C-130's than any other service or country, and many ex-Air Force personnel retain fond memories of the "Herky Bird." This nostalgia inspired this model project. My good friend, Lance Schneider, an excellent R/C flier and builder, had long thought of building an R/C model of the C-130's as he remembered them from his tour in the Air Force. What he wanted was to get a friend of his to do the design work and draw up the plans for this large project. After a considerable investment in Rebel Yell Bourbon, Lance had gotten me to agree to work up a set of construction drawings for an R/C C-130. Now, viewing the completed project, I'm obviously pleased with the whole idea, and Lance is the command pilot of his own personal C-130.

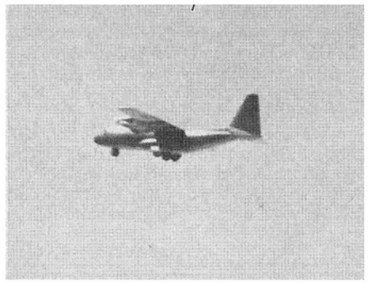
This model was designed and built to be an active flying machine; one easy enough to fly that it could really be used as a Sunday fun airplane. The only intentional deviation from the scale outline is several inches added to the wing chord and span for increased wing area to insure a good flying model. It's up to the individual builder, as usual, to add enough details to determine how competitive the model would be in any scale competition. The scale used is just about 1 inch equals 1½ feet; the model has a 90 inch wingspan and is 62 inches long, with 925 square inches of wing area. The C-130 proportions worked out well; the aircraft balanced perfectly as built, with the radio gear installed normally under the wing opening in the fuselage.

For power, two K&B .40's with 10-6 props were used in the inboard nacelles and two K&B .19's with 8-6 props in the outboard nacelles. Four .19's would probably fly the model, but the .40's were used for some extra insurance. A concern, was the relatively narrow tread on the fuselage mounted main landing gear, but the four wheels on their torsion bar set-up worked out very well. A double wheel nose gear attachment was made up to use on a standard coiled wire nose gear, and the model handled well on the ground; it was stable enough for smooth taxiing and nice takeoffs and landings. Lance installed the engines inverted so they could be cowled in more realistically, but I would still recommend side mounted engines for easier access to them, better cooling, and I feel better reliability.

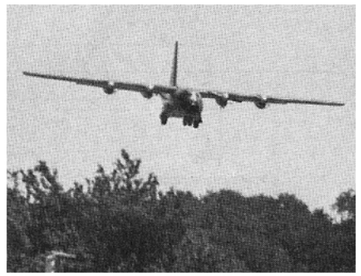
The construction used was a combination of different techniques, chosen for ease of building. The tail surfaces were balsa sheeted foam cores. This was an easy and quick job. The wing was built up and sheeted due to the four throttle linkages necessary, plus the aileron and flap linkages. We felt it was easier to install this much linkage in a built-up structure than to try to put it into a foam core. The wing was built in one piece, flat on a building surface, and all linkages were installed before the planking was completed. The four nacelles (box structures) were built and added to the notched positions on the wing. Spars were doubled in the center section, and the completed, sheeted structure was rigid and amply strong.

The most unusual portion of this project was the fuselage which was a foam core, covered with fiberglass cloth and epoxy. The technique for building the large, complex

This series of flight shots suggests a full scale Hercules on an approach for landing.



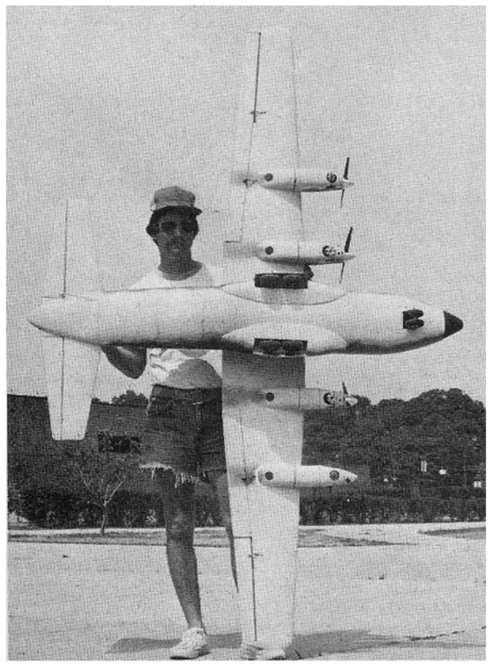
Dick reports that the Hercules is as easy to fly as a normal sport type model. Try one.



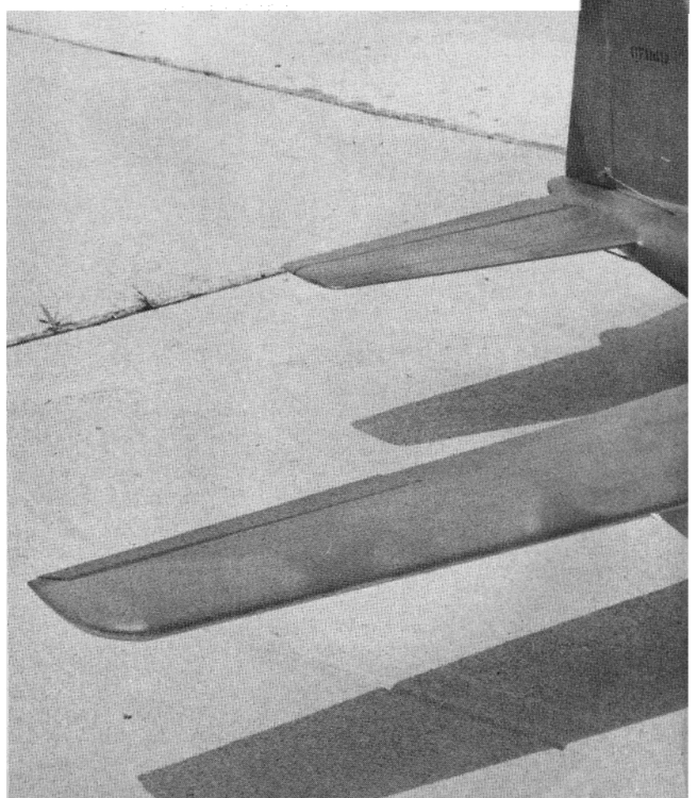
shaped fuselage was easy. It was made up in two halves; from the wing trailing edge to the nose, a basic cylinder was cut to shape with a hot wire foam cutter. The nose was trimmed in accordance with the plan side and top views, and hand shaped to the necessary contours. From the wing trailing edge to the tail, another foam block was cut to the top and side views, and again hand shaped to the final contours. The foam shapes were cut to add in the plywood bulkheads and radio compartment sides, and epoxied together. Foam landing gear fairings were cut and shaped in the same manner. Finally, the entire fuselage was covered with one layer of heavy fiberglass cloth and epoxy glue.

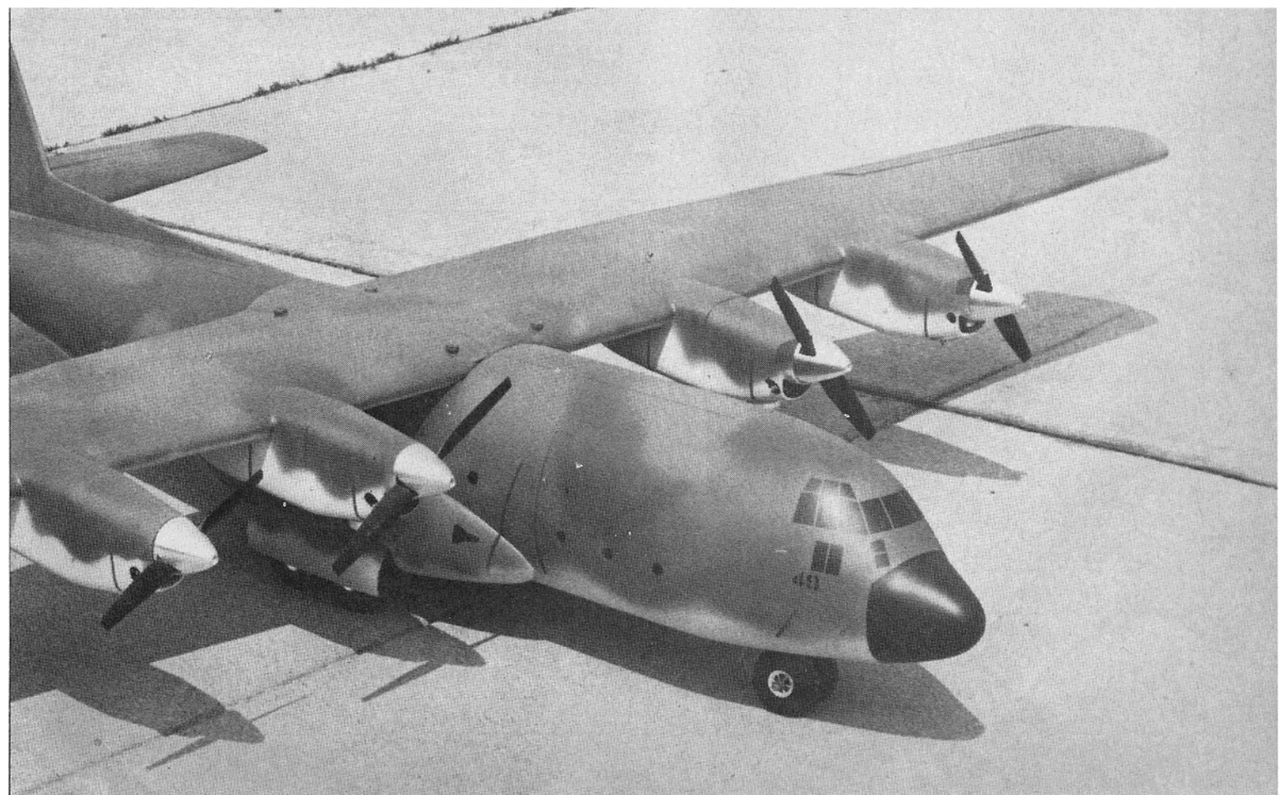
It didn't seem right to refer to a large, scale, four engined transport aircraft as an uncomplicated project, but due to the construction techniques used, this model really was quite easy and quick to build. Lance had the entire model basically built in less than three months, and then spent another three months on linkage details and applying the finish. All-up weight turned out to be a little over 15 pounds, heavier than we had hoped, but not bad for a model of this size.

First flight attempts were plagued by the usual troubles. Bad glow plugs, a dead starter and plug battery, a loose engine backplate, a stuck ring in one engine and 95 degree, high humidity weather didn't help



Builder, owner and pilot of the Hercules, Lance Schneider, is shown here with his handiwork. Notice the wheel arrangement, control linkages, engine placement and flap installation.





our efforts. Perseverence, though, paid off and the C-130 was soon realistically taxiing up and down our grass field. First flights were made with the engine cowls off, for ease of making the necessary throttle adjustments. The first takeoff was smooth, gradual, and not too fast—just like the real thing. As I grabbed for my camera, Lance's plane climbed to altitude for safety; the C-130 got so high so fast it was a speck in the camera finder. After a few passes around the field, he pulled it into a traffic pattern approach, made a slow, steep turn onto final, leveled out for landing, cut the throttles (which we knew were set too low) and all four engines died. This large glider then floated smoothly by, flared, touched on the main gear first, dropped its nose, and rolled to a stop. Not a bad first flight.

With some throttle adjustments, subsequent flights were more relaxing. During one flight, one of the inboard engines cut. Lance throttled back a little, maintained altitude, with the three engines, and had no problems slowing down for the approach and uneventful landing. Full power does fly the model too fast for realism; ¾ throttle was about right for most flying. Lance reported the plane handled well, responded quickly and was stable. The next step was to cut open the cargo door for those low passes to drop parachute packages, jeeps, etc.

Construction

For those interested in adding a C-130 to their air force, we'll get into the construction. Looking at the easy items first, the tail surfaces are balsa covered foam cores. With a span of 34 inches, working on the horizontal stabilizer is like building a small wing. Building with foam cores, has been covered many times, in many articles and so it won't be covered in detail here. On these C-130 surfaces, the airfoil is quite thin; so extra care must be taken to prevent warps. After sheeting one side of the core, trim the sheeting and place the core back into the bottom foam block it is cut from. This technique will hold it straight while the top sheeting is being applied. After adding the leading edge and tip wood, the surface is cut apart along the hinge line; wood is added to the cores on the hinge line, shaped, and the hinge slots cut in. The two stab halves are joined and reinforced with a narrow strip of fiberglass cloth and epoxy.

Wing

Moving to the wing, we go to a completely different type of construction; a fully sheeted rib and spar structure. Since the top wing surface is straight and all dihedral taper is in the bottom, the wing can be built flat upside down on a working surface. For a warp-free wing, it would be best to build it all in one piece, although, it could be built in halves and joined. Each rib is laid out with a "foot" on it, to hold it aligned until sheeting is applied and the wing is removed from the building board. Start by pinning the top spar doubling the center section with the necessary joints staggered to the building surface over the plans. To build the wing section not shown on the plans, simply extend the spar lines straight out and mark off the rib locations in accordance with the tip section shown; that is all that is needed. Set and glue the ribs over the spar, then add the bottom spar and the leading edge.

The 3/32 inch sheet balsa planking, 4 inch widths being convenient, is applied along the leading and trailing edges. Some of the center planking is left off until later, to be added after the throttle, aileron, and possibly flap linkage is installed. With most of the bottom planking in place, the wing can be removed from the building board, the rib "feet" trimmed off, and the planking applied to the top wing surface. The ailerons are cut from the completed wing, and wood is added along the hinge line to accept the hinges. The wing's leading edge is notched for the installation of the engine nacelles.

Nacelles

The four nacelles are simple structures, consisting of sides, doublers, and bulkheads. They are epoxied into the wing, and must be installed so the engine thrust lines will be straight ahead; no side or down thrust is used. Kraft radial engine mounts are used on the original model and K&B .40's in the inboard nacelles and K&B .19's in the outboard nacelles. A plug for the cowlings (all four are identical) is carved from foam, smoothed, painted, and used to make four plaster molds. Fiberglass cloth and resin are laid-up, ¬ layers, in the molds. When cured, the plaster molds are broken away, and the cowlings are trimmed and sanded, ready for use. with the four engines mounted, throttle linkages installed, and adjusted for the correct throw, and aileron linkage installed, the rest of the wing planking is added to complete this large part of the project.

Fuselage

The fuselage is the most unusual part to be built; if you haven't tried a foam structure, don't worry about it—it's easy, quick, and strong. Carving and sanding to shape is necessary, but it's not a bad job. To start, use two templates made according to the plan to cut the basic fuselage shape from the bulkhead C position to the nose. Depending on the hot wire foam cutter available, you may find it easier to cut the fuselage in a top and bottom section, split along the horizontal centerline. With this fuselage "blank" cut, it can be put back into the blocks it is cut from. Templates are made from the plans for the top and side nose shapes, and the hot wire cutter is used to cut the top and side of the nose to shape. After that, it's necessary to do some freehand shaping on the nose; use photos of any C-130 as a guide. The landing gear fairings can be cut from the left over fuselage blocks (again using the plan templates). These also need freehand shaping on each end.

The rear section of the fuselage is done a little differently. A foam block is cut to the top and side view shapes, using a hot wire or a band saw. This must then be shaped to match up with the front fuselage section. The

foam fuselage is cut apart at the bulkhead B location and notched for bulkhead A. Between bulkheads B and C, the foam is cut away for the plywood radio compartment sides. All these foam sections and plywood pieces are then epoxied together. Now it's starting to look like an airplane. The landing gear wood blocks are installed, the wire gears made and installed, and the foam landing gear fairings cut as they are necessary for wheel clearance before being glued in place. The foam is cut away as necessary in the wing saddle area, and the wing is checked for a proper fit.

Finishing Details

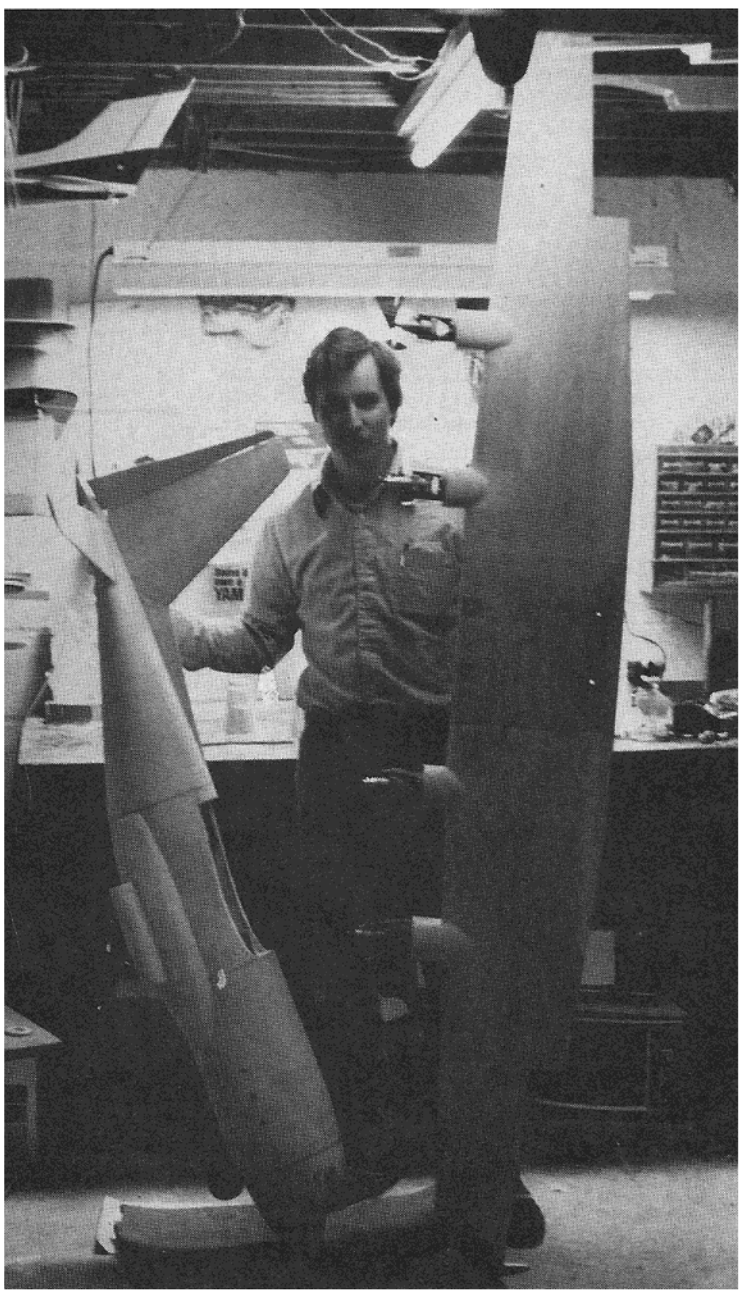
Construction of the original model would have gone faster, but every time I stopped by to see how Lance was doing with his project, we couldn't resist assembling the parts at that stage to get an idea how this model was going to look. Talking about how well it looked took a lot of time—probably typical of happy modelers.

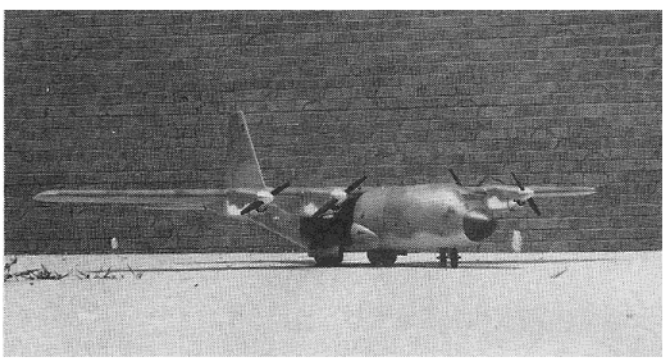
The original intent was to sheet the foam fuselage core with 1/16 inch or 3/32 inch balsa, but due to the compound curves involved, Lance decided to cover the foam directly with only fiberglass. Heavy "boat" cloth was used and one layer applied and coated with HobbyPoxy Formula II epoxy glue. Yes, a lot of HobbyPoxy was used, but it sure worked out well. A thorough sanding, touched up where necessary with more epoxy, resulted in a fairly light, strong and smooth fuselage. Now things were ready for final assembly.

The horizontal stab was installed through the fuselage and epoxied in place. The vertical stab was epoxied on top of the fuselage and reinforced with several short sections of ¼ inch dowel into the fuselage and into the foam core. Holes were drilled through the foam fuselage core for elevator and rudder pushrods. The forward fuselage foam was hollowed out, and the nose gear steering pushrod was installed. Hardwood blocks were added, then drilled and tapped for the four wing hold-down bolts. Servo mounts were installed in the fuselage for the rudder and elevator servos, and a provision was made to retain the receiver and battery pack.

For the finish, Lance applied Silkspun Coverite and used Balsarite to insure good adhesion, to the wing and tail surfaces. After several coats of clear dope and a light sanding on the Silkspun, the entire model was sprayed with gray automotive lacquer primer. Several coats were sprayed on, with a thorough sanding between coats. The colors used were made by Military Flats Aero-Gloss. Light gray was applied on the underside; dark green, medium green, and brown were used on the top surfaces. With so many C-130's in use with so many different Services, there are a wide variety of paint schemes which can be used for an individual model.

Summing up our efforts here, this was a big model building project. The C-130 Hercules had almost an 8 foot wing span, four engines, a large fuselage, and weighed 15 pounds. But it was an easy building project, which resulted in a plane that could be actively flown. Try four engines—have four times as much fun.





The realistic appearance of the Hercules has been achieved without a lot of intricate detailing. This is a scale project intended to be practical for use as a sport model. Here we see the plug for the fiberglass cowlings and several finished units (**top**). The construction method used for the fuselage permits compound curves to be duplicated with relative ease (**left**). This is a big model with a 7½ foot span.