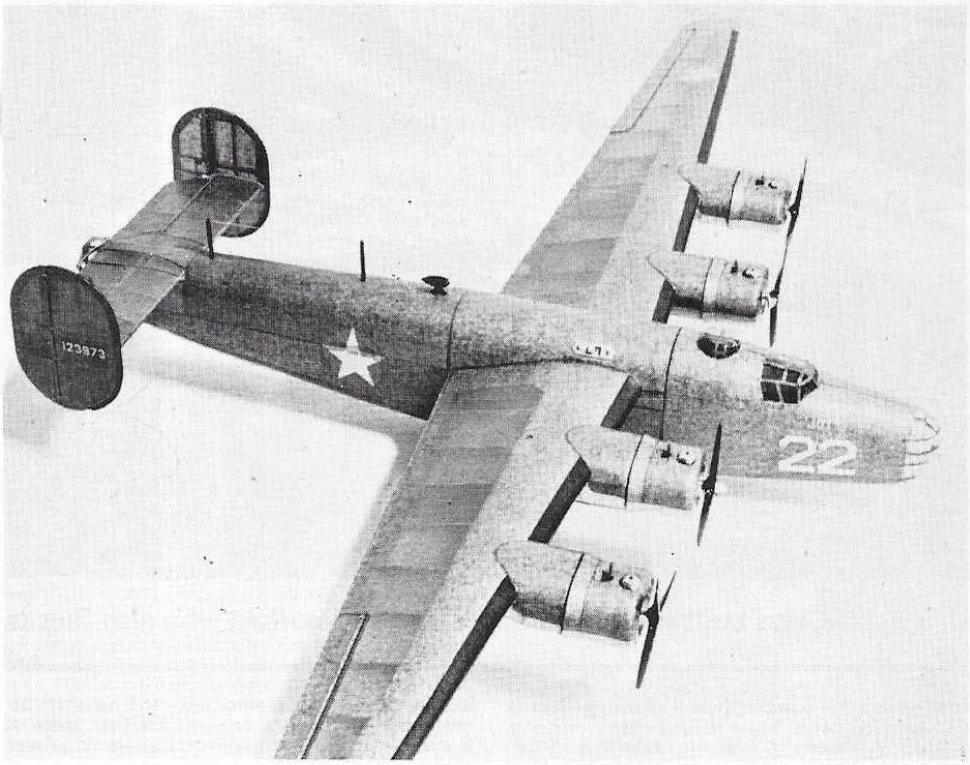
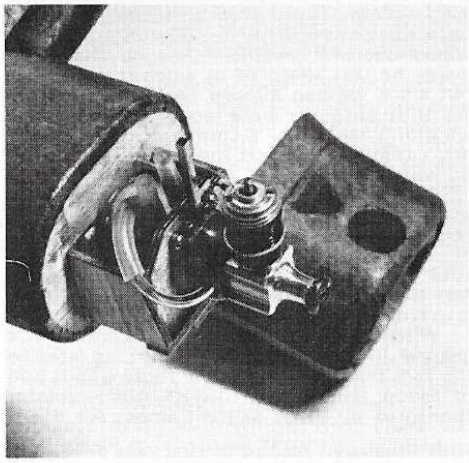
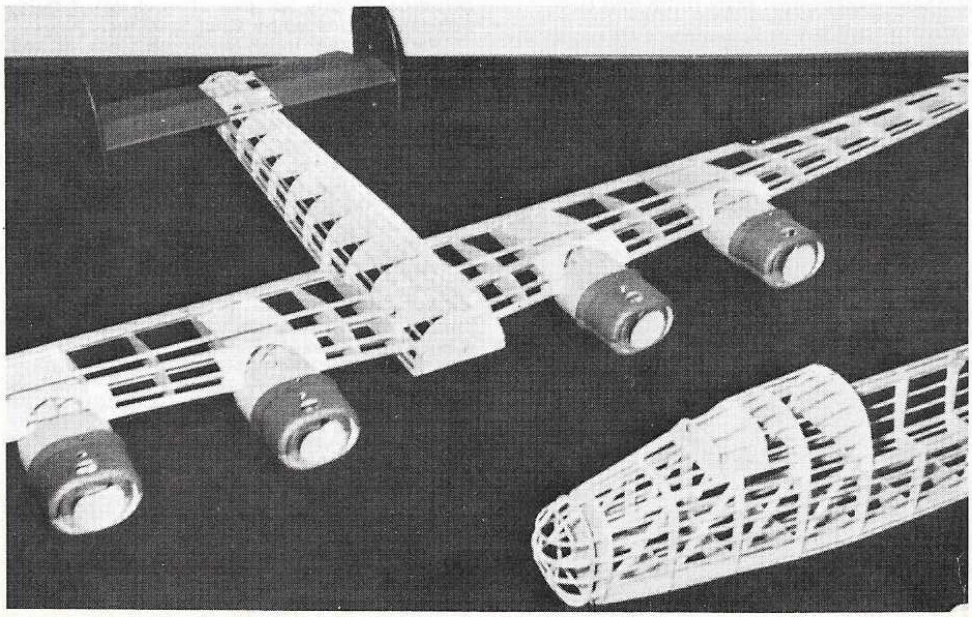
THREE-CHANNEL B-24



Above: If modelers were not so nutty, there could not be such fun models. Mottled look is from the colored tissue covering. Right: All it needs is four of these. Tank is in the nacelle giving ten-min. engine runs. Below: See, that's all there is to it. It is just like a Cleveland kit before covering.





Would you believe—a 55" wingspan, four-engine, radio controlled, three-channel Consolidated B-24D Liberator with an all-up flying weight of just 36 oz.? This particular Liberator was an early production model from the San Diego factory and saw service with the 28th Bomb Group, 11th Air Force in the Aleutians.

I have always wanted a multi-engined model, but never could find a reasonably priced kit or one close enough to scale to suit my needs. Everything about this aircraft seemed to fit what I had in mind—at 1/2" scale the wingspan is 55", compact enough to fit in almost any trunk without removing the wing section, making it a simple task getting to and from the field. By keeping the construction very light, four 020 Pee Wee RC engines furnish enough power for a realistic and responsive flyer, and at a relatively low cost. The high wing and motor configuration allow the use of skids for landing without snapping props and that means wheels up performance in the air without the need for the retract gear, extra channel or heavier construction to accommodate them. Takeoffs are accomplished with a dolly or by hand launching; landings are much easier on a grassy area but are also possible on blacktop.

I thoroughly enjoy "building" a model and this type of construction is, in addition to being extremely lightweight, very satisfying to the meticulous builder and easily reproduces scale contours. You might say it is the other end of the stick from the slab-sided or high performance jobs. This model is exact scale in all proportions except a slightly modified airfoil. The covering material is Marlow Jap tissue which is available in olive drab, neutral grey and black and finishes nicely with two coats of Sig Lite-Coat dope.

The radio used here is a Digit Migit three-channel, controlling throttles, elevator and coupled aileron and rudder. Four servos could be fitted in the available space, and I doubt that the additional weight would seriously affect the performance. Since installation requirements for different radios and personal preferences are so varied, I have only briefly covered the actual component installation in the text, but the photos show how mine was done and it works quite well. The battery pack can be shifted forward in the fuselage to change the CG which is shown on the plans at the furthest aft position which is safe to use. A 1/4-1/2" ahead of this position is all to the good.

Assuming you have adequate tools and equipment for building, the construction of this plane is quite simple and follows the procedures for any stick-and-tissue airplane (remember the old Cleveland kits?). I like to use Handi-

A nearly five-ft. span Sport model for fun flying has four snarling Pee Wee 020s. It could even win a Stand-Off Scale meet—if you don't mind hand launching. / by Lee Kiracole

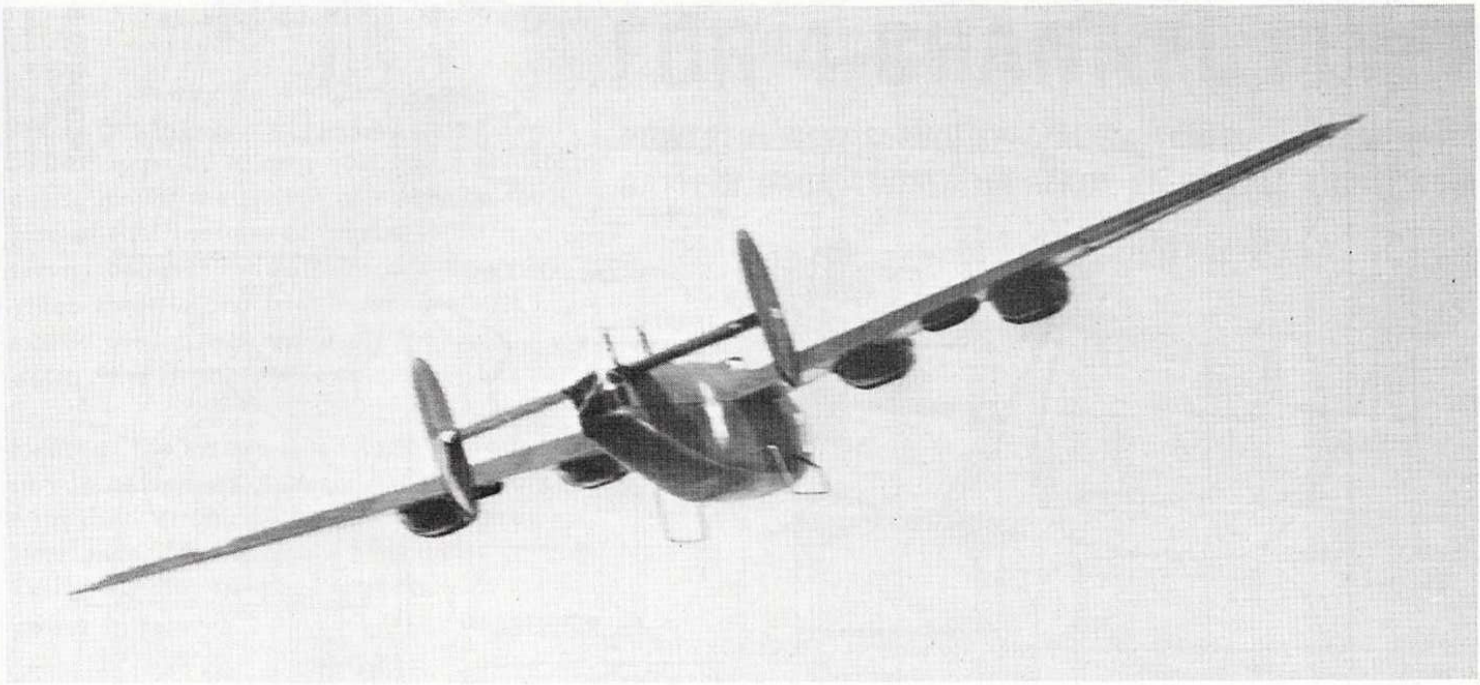
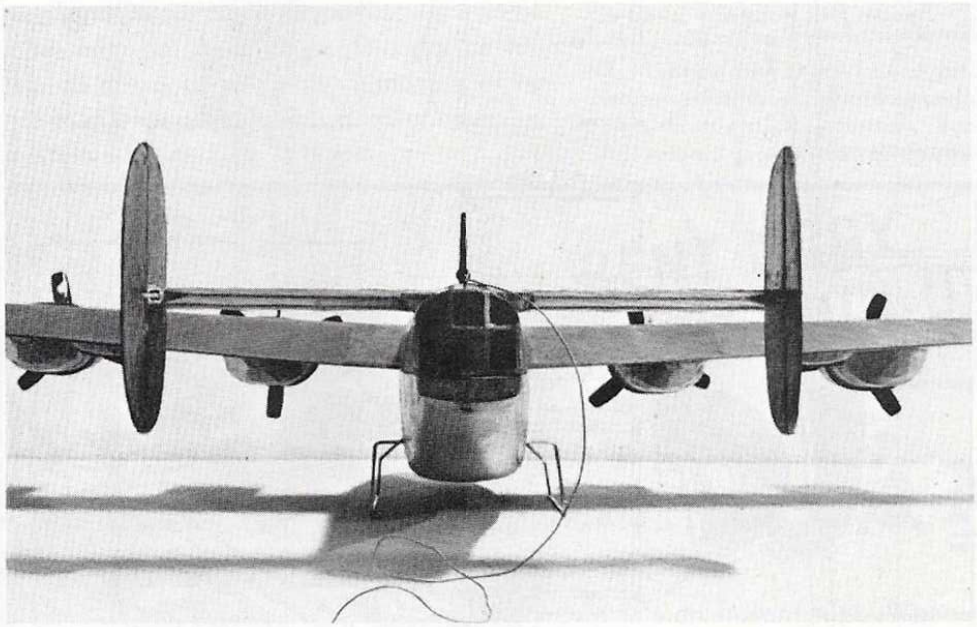
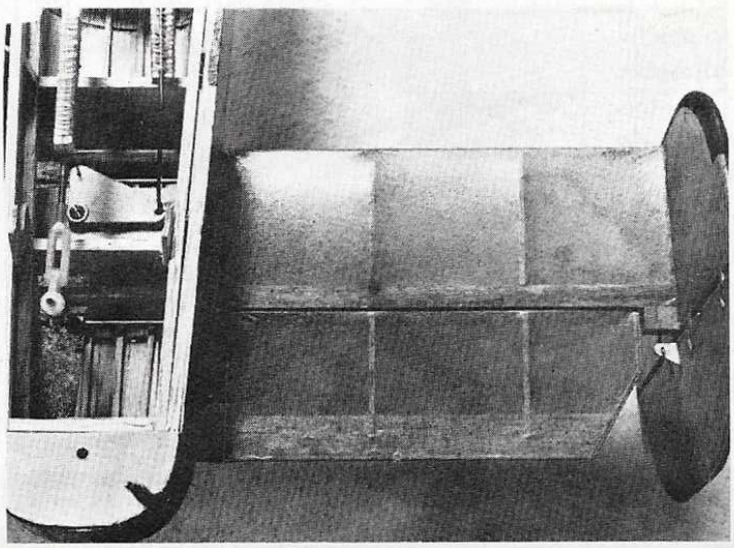
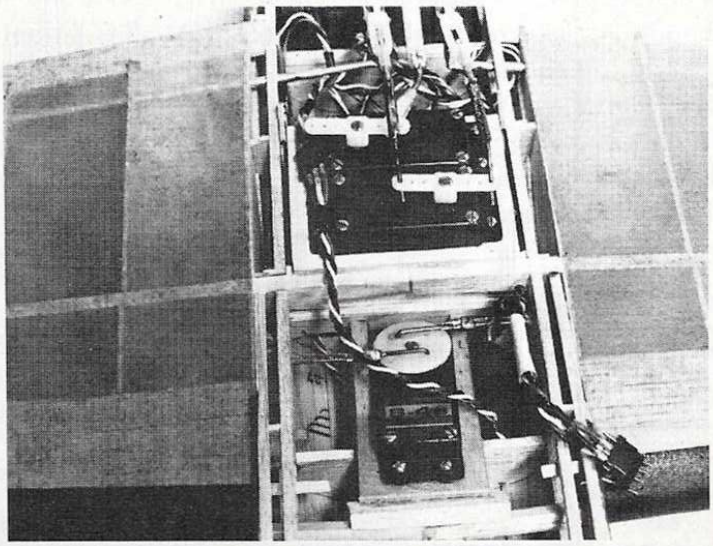


Photo by Monty Groves



Above: And it flies just great—loops, wing-overs, rolls, etc. are easy. What's more, a school field is suitable. Wait till the neighbors see this fly past! Left: Just the south end of a northbound B-24D. Below left: At the tail a bellcrank system controls the twin rudders which are coupled with the ailerons. Elevators operate normally. Below right: All the servos are located under the wing. Rear-most servo operates the four throttles.





3-CHANNEL B-24

wrap clear plastic film to protect the plans from stray shots from the glue gun loaded with Titebond.

Build two fuselage sides over the side view using 1/8" square balsa for all the framework. A little extra care in fitting the diagonals will pay off in strength of structure. Leave the top longerons and rear verticals in one piece until after the sides are joined together; then use a razor saw to separate the top section.

The entire top of the fuselage is removeable (aft of the cabin) by displacing the screw under the tail turret, sliding the top back about 1/4", then lifting it off. Epoxy the plywood interlocks in place being careful not to get glue on parts that are not to be glued. See side view for area of interlocks to be glued to top or bottom section. Since most of the top surface of the fuselage frame is flat, the sides are joined upside down over the top view, pinning them

in place with cross members in position on plan.

Cut all cross members before joining sides to assure top and bottom members are of equal length. Use adequate blocking to hold frames parallel and at right angles to the building board. When thoroughly dry, sever the top longerons and rear verticals and add 1/8" thick filler pieces at frames 7, 8 and 19. A 1/4" dia. dowel at frames 7 and 8 is epoxied in after wing is mounted on the fuselage. Reassemble top and bottom sections and glue on all formers, frames 1-19. It is a good idea to lay a piece of Handiwrap between tops of frames 7 and 8 to prevent formers from sticking to each other.

Be sure all formers are at right angles to the fuselage centerlines to make proper outside contour. Add all stringers (1/16" sq. strip except for edges of removeable sections which are 1/16 x 1/8"), omitting those in the area above the stabilizer. Add the 1/8" thick balsa stabilizer supports. At rear of fuselage epoxy in the 1/16" plywood plate and hardwood block to top section and 1/16" balsa plate and balsa block to the bottom section. Do not carve balsa block to shape until after the fuselage is sheeted.

Set fuselage aside and construct stabilizer over plan as shown. Notch out 1/8 x 3/8" main spar to receive ribs S1 and drill hole to pass rudder control cables at each end. Rudder control assembly is installed in stabilizer as it is constructed. I used Pylon .030 Gold-n-Rods which easily conform to this radius. Solder Z-links and connectors to cables at each end but do not solder cables to 1/16" brass tube until after the rudders are mounted.

Elevators are built next with 1/16" aluminum tube in place to assure alignment of holes. 1/16" dia. collars are filed flat on one side and epoxied in place with the set screw at the top surface. Round off forward edge of elevator same as S1a. Cover elevators with tissue (olive drab on top, grey on the bottom) leaving set screws exposed for assembly and adjustment. Don't forget the elevator actuator collar and arm when assembling elevators to stabilizer. Round off leading edge of stabilizer. Do not cover stabilizer with tissue until fins and rudders have been mounted.

Rudder assemblies are constructed next. Make one right and one left (horn sticks out on opposite sides). Build rudders with .032 wire hinge pin in place, but be sure it can be removed. Separate fin and rudder, round off leading edges and taper R8 into the trailing edge. Rudder assemblies can be covered now, leaving the wood bare where it will glue to S3.

Note that the lower portion of the inside faces are grey, while the balance is olive drab with black edging. Glue the fins to the stabilizer, taking care to align them accurately. Hook rudder control Z-links into rudder horns and with a twisting motion slide rudders onto fins and install .032 wire hinge pins. Rudder control cables can now be mounted to

the fuselage and remainder of stringers added.

Wing construction is relatively simple and straightforward. The 3/16 x 3/8" spruce main spar is tapered and shaped on the end as shown on the wing section from W12 to the tip before pinning to the board. Trailing edge stock is cut to length and notched out for the wing ribs over plan. Glue in wing ribs being careful to get W1 at right angles to the main spar. Note that ribs W3, W4, W6 and W7 are set at a different angle than the rest. Make an angle guide from scrap balsa to hold these ribs in position until top spars are in place. Glue on leading edge strip. Assemble pieces W14 through W18 (3/32" thick) and when dry, glue to wing at centerline of leading and trailing edges. Assemble ailerons same as for elevators with 1/16" collars epoxied in place. I used 1/16, 3/32 and 1/8 telescoping tubing for aileron torque rods and 3/32 rod for actuator arms. Add 1/16" thick sheet between ribs at nacelle locations at bottom of wings. Remove wings from plan and add bottom spars (omit bottom spars between W3 and W4 and between W6 and W7).

Nacelles are constructed directly on the wings, following numerical sequence. Fuel tanks indicated are one oz., Pylon slant style which give exceptionally long engine runs (which comes in handy if an engine or two is cranky), if different tanks are used make cutout changes as required in N3 formers. After tanks are installed, coat N3 liberally with epoxy and be sure to seal around tank to prevent any fuel getting into nacelle. Apply sheeting on nacelles but do not sheet wing yet.

Cowls can be constructed anytime. Assemble N1 to N2 with blocking of correct length, carve outside to proper curvature, then wrap with 1/32" thick balsa sheet. Cut openings in top after motors are mounted to assure proper location. Epoxy motor mounting plates (3/32" plywood) in position and mount motors to determine best position for the throttle cables. About three degrees of downthrust is advisable but can be accomplished with shims instead of slanting the motor mount if you desire.

Wings may be mounted to top section of fuselage now, epoxying in the 1/8" filler and 1/16" plywood dihedral brace. Epoxy in the 1/4" dia. front locator dowel (leave about 1/4" of dowel protruding from frame 8). After wings are mounted and throttle cables installed, the wings can be sheeted with 1/32" thick balsa as shown on the plans.

The entire fuselage is to be sheeted with 1/32" thick balsa. Edge glue three-in. wide strips together and cover one section at a time (former to former), gluing to all stringers and formers.

Nose canopy, cabin, top turret and tail turret are formed over carved balsa blocks, from heat forming plastic; lines are narrow strips of tissue covering material. Paint interior of areas black before attaching plastic. Edge of plastic should butt against edge of 1/32" balsa sheeting. Epoxy the landing skid plywood plates into the fuselage (with 1/8" ply blocking in place) and locate holes in side of fuselage.

After all sheeting is accomplished the tissue can be applied. Use the grey tissue for the bottom areas first, since a small overlap of olive drab will cover grey very nicely. Water shrink completed covering but do not dope until after dummy wheels, fairings, antenna, etc. are attached—glue does not hold as well to the doped surface (especially if you use Sig Lite-Coat). To prevent green from showing through the tissue insignia, I preshrunk a sheet of extra-heavy Silkspan, then doped yellow tissue to it while it was still on the frame. Cut the numerals and the letters for the name of the plane, JOY, from it. Also cut out the fields for the stars from blue Jap tissue and dope them to the white Silkspan. The large numerals on the side are two thicknesses of white Silkspan. When dry, cut out insignia and apply to airplane with dope.

A few more details and you should be ready for the field. I made an electric starter from an old Dumas boat motor and other miscellaneous scrap around my shop, and would heartily recommend the use of some kind of similar equipment for ease of getting all four 020 Pee Wees fired up at once.

This model's flying ability needs no explanation. It performs much like a hot Tri Squire. Before launching, and

with all engines running, top off the tanks. If you lose an engine or two in flight don't worry—it will still fly under control. And if you have never heard four little engines, slightly out of sync, screaming to let them go, you have a real experience in store for you.