BUILDING INSTRUCTIONS

The Grumman F11F-1 "Tiger" design lends itself admirably to ducted fan free-flight or controline flying. Its highly sweptback wing provides excellent longitudinal and lateral stability. Original test models flew very well, with the wing at only a 2 degree angle. Filling an airfoil onto the impeller blades is well worth the effort, plus a firm engine mount, good fuel and removal of excess exhaust residue from the duct after every few flights.

To clarify all points of the structure, exploded and cut-away drawings are shown on plans. We suggest you familiarize yourself with the design before starting construction, and decide at this time whether you wish to build a free-flight or controline version. Note the landing gear is optional. We recommend flying without the gear to obtain maximum performance, tho you may use it if you wish to make take-offs etc. The gear may be attached and removed on the field by slipping it into and out of the eyelets. Bear in mind that a ducted fan propulsion system is not as efficient as a conventional prop, so all possible weight saved will greatly add to the climb angle. Filing an airfoil onto the impeller blades is well worth the effort, plus a firm engine mount, good fuel and removal of excess exhaust residue from the duct after every few flights.

Most die-cut balsa parts are identified by letter and number. The letter will indicate whether it is used on the fuselage, duct or wing. 3/32" sheet parts are the tail surfaces. Other unmarked 1/20" sheet parts are the 1/20" die-cut sheet planking gores, used to plank the fuselage. These gores have been die-cut as closely as feasible to the exact shapes needed to form the exact scale "coke-bottle" fuselage.

TAIL SURFACES: As these are so simple, it is best to start construction at this point, and get them out of the way. Trim and sand both rudder and stabilizer units (after they are mated) to an airfoil section. Sand well to minimize unnecessary weight. Free-flight versions will need only wire supports to form a flexible, yet durable mount. Controline type models will need a single wire mount, pivoting in the fuselage, as the stabilizer in its entirety moves up and down. An optional method is to build conventional elevator surfaces, and hinge with fabric. The elevator horn is a little unusual, in that for maximum thrust efficiency, it should not interfere with the duct, and therefore should be buried between the duct wall and the planking. A slight arc bent into the wire will allow clearance.

WING PANELS: Doit left and right wing panels are shown on the plan. The assembly is extremely easy and should take very little time. Pin the trailing edge flat on the plan, position the 1/16" x 1/8" bottom spar, and cement the ribs in place, after bevelling ends and spar notches to allow for sweepback. Ribs W-1 and W-2 should be shimmed up 1/20" off the plan to allow for the sheeting. Position leading edge and top 1/16" x 1/8" spar to complete the basic panel, except for the winglip. The winglip is die-cut 3/32" sheet, and should have a weight attached (right panel only) to compensate at least partially for the controline leadout and controlwire. Remove panel from plan and construct other panel in like manner. Plank area between W-1 and W-2 with 1/20" sheet top and bottom. Ribs should be pierced and reinforced at this time for the wire mount in the fuselage, which attaches the wing to the fuselage. This same wire mount will also provide the dihedral angle.

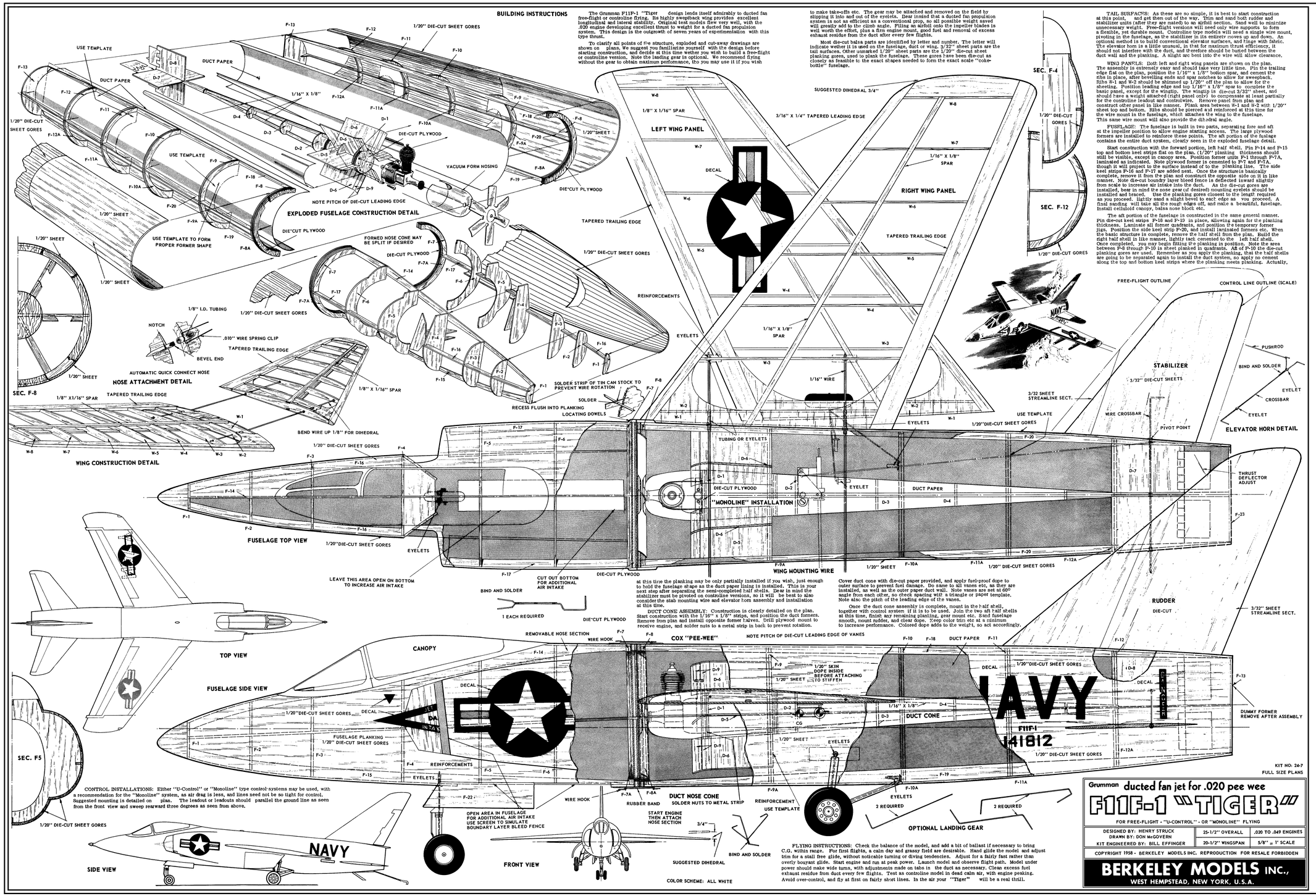
FUSELAGE: The fuselage is built in two parts, separating fore and aft at the impeller position to allow engine starting access. The large plywood formers are installed to reinforce these points. The aft portion of the fuslage contains the entire duct system, clearly seen in the exploded fuselage detail.

Start construction with the forward portion, left half shell. Pin F-14 and F-15 top and bottom keel strips flat on the plan. (1/20" planking thickness should still be visible, except in canopy area. Position former units F-1 through F-7A, laminated as indicated. Note plywood former is cemented to F-7 and F-7A, though it will project to the surface instead of to the planking line. The side keel strips F-16 and F-17 are added next. Once the structure is basically complete, remove it from the plan and construct the opposite side on it in like manner. Note die-cut boundry layer bleed fence is deflected inward slightly from scale to increase air intake into the duct. As the die-cut gores are installed, bear in mind the nose gear (if desired) mounting eyelets should be installed and braced. Use the planking gores closest to the length required as you proceed, lightly sand a slight bevel to each edge as you proceed. A final sanding will take all the rough edges off, and make a beautiful, fuselage. Install celluloid canopy, balsa nose block etc.

The aft portion of the fuselage is constructed in the same general manner. Pin die-cut keel strips F-18 and F-19 in place, allowing again for the planking thickness. Laminate all former quadrants, and position the temporary former jigs. Position the side keel strip F-20, and install laminated formers etc. When the basic structure is complete, remove the half shell from the plan. Build the right half shell in like manner, lightly tack cemented to the left half shell. Once completed, you may begin fitting the planking in position. Note the area between F-8 through F-10 is sheet planked in quadrants. All of F-10 the die-cut planking gores are used. Remember as you apply the planking, that the half shells are going to be separated again to install the duct system, so apply no cement along the top and bottom keel strips where the planking meets planking. Actually, at this time the planking may be only partially installed if you wish, just enough to hold the fuselage shape as the duct paper lining is installed. This is your next step after separating the semi-completed half shells. Bear in mind the stabilizer must be pivoted on controline versions, so it will be best to also consider the stab mounting wire and elevator horn assembly and installation at this time.

DUCT CONE ASSEMBLY: Construction is clearly detailed on the plan. Start construction with the 1/16" x 1/8" strips, and position the duct formers. Remove from plan and install opposite former halves. Drill plywood mount to receive engine, and solder nuts to a metal strip in back to prevent rotation. Cover duct cone with die-cut paper provided, and apply fuel-proof dope to outer surface to prevent fuel damage. Do same to all vanes etc, as they are installed, as well as the outer paper duct wall. Note vanes are set at 60° angle from each other, so check spacing with a triangle or paper template. Note also the pitch of the leading edge of the vanes.

Once the duct cone assembly is complete, mount in the half shell, together with control system if it is to be used. Join the two aft half shells at this time, finish any remaining planking, gear mount etc. Sand fuselage smooth, mount rudder, and clear dope. Keep color trim etc at a minimum to increase performance. Colored dope adds to the weight, so act accordingly.



CONTROL INSTALLATIONS: Either "U-Control" or "Monoline" type control systems may be used, with a recommendation for the "Monoline" system, as air drag is less, and lines need not be so tight for control. Suggested mounting is detailed on plan. The leadout or leadouts should parallel the ground line as seen from the front view and sweep rearward three degrees as seen from above.

FLYING INSTRUCTIONS: Check the balance of the model, and add a bit of ballast if necessary to bring C.G. within range. For first flights, a calm day and grassy field are desirable. Hand glide the model and adjust trim for a stall free glide, without noticable turning or diving tendencies. Adjust for a fairly fast rather than overly bouyant glide. Start engine and run at peak power. Launch model and observe flight path. Model under power should make wide turns, with adjustments made on tabs in the duct as necessary. Clean excess fuel exhaust residue from duct every few flights. Test as controline model in dead calm air, with engine peaking. Avoid over-control, and fly at first on fairly short lines. In the air your "Tiger" will be a real thrill.

KIT NO: 24-7
FULL SIZE PLANS

Grumman ducted fan jet for .020 pee wee

F11F-1 "TIGER"

FOR FREE-FLIGHT - "U-CONTROL" - OR "MONOLINE" FLYING

DESIGNED BY: HENRY STRUCK DRAWN BY: DON McGOVERN	25-1/2" OVERALL	.020 TO .049 ENGINES
KIT ENGINEERED BY: BILL EFFINGER	20-1/2" WINGSPAN	5/8" = 1' SCALE

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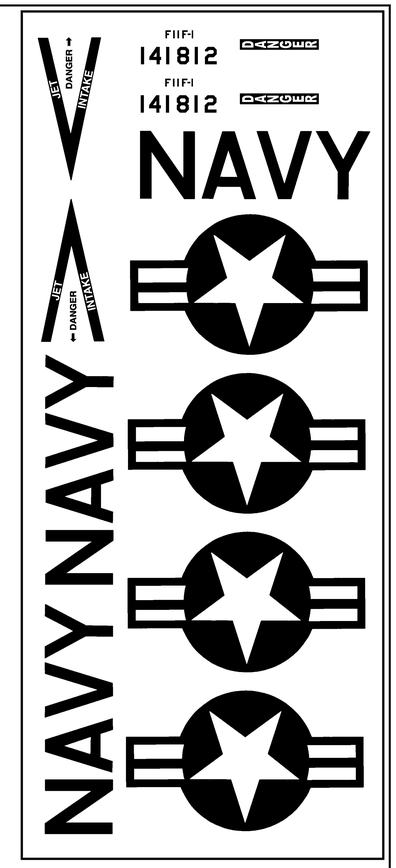

NOTE: I FOUND NO DIE-CUT PARTS FOR THIS PLAN. YOU CAN FIND ALMOST ALL PARTS OUTLINED ON THE PLAN SOMEWHERE, USUALLY IN THE TOP OR SIDE VIEWS. THE ROOT RIB IS SHOWN ON THE FUSELAGE SIDE VIEW. JUST REDUCE IT PROPORTIONALLY FOR THE REST OF THE RIBS AND REPOSITION THE SPAR NOTCHES ACCORDING TO THE PLAN. MAKE SOME ADDITIONAL COPIES OF THE PLAN AND CUT THE PART OUT OF ONE OF THESE COPIES FOR A PATTERN. USE A "GLUE STICK" PURCHASED FROM AN OFFICE SUPPLY STORE TO PASTE THE PATTERN TO A SHEET OF BALSA BEING SURE THE BALSA GRAIN DIRECTION RUNS THE CORRECT WAY. CUT THE PART OUT, CUTTING THOUGH THE PAPER PATTERN, AND THEN PEEL THE PATTERN FROM THE BALSA PART. USE ALCOHOL TO LOOSEN THE PASTE IF NECESSARY. DETERMINE THE BALSA THICKNESS BY COMPARING IT TO THE PLAN.

"PLANEMAN"