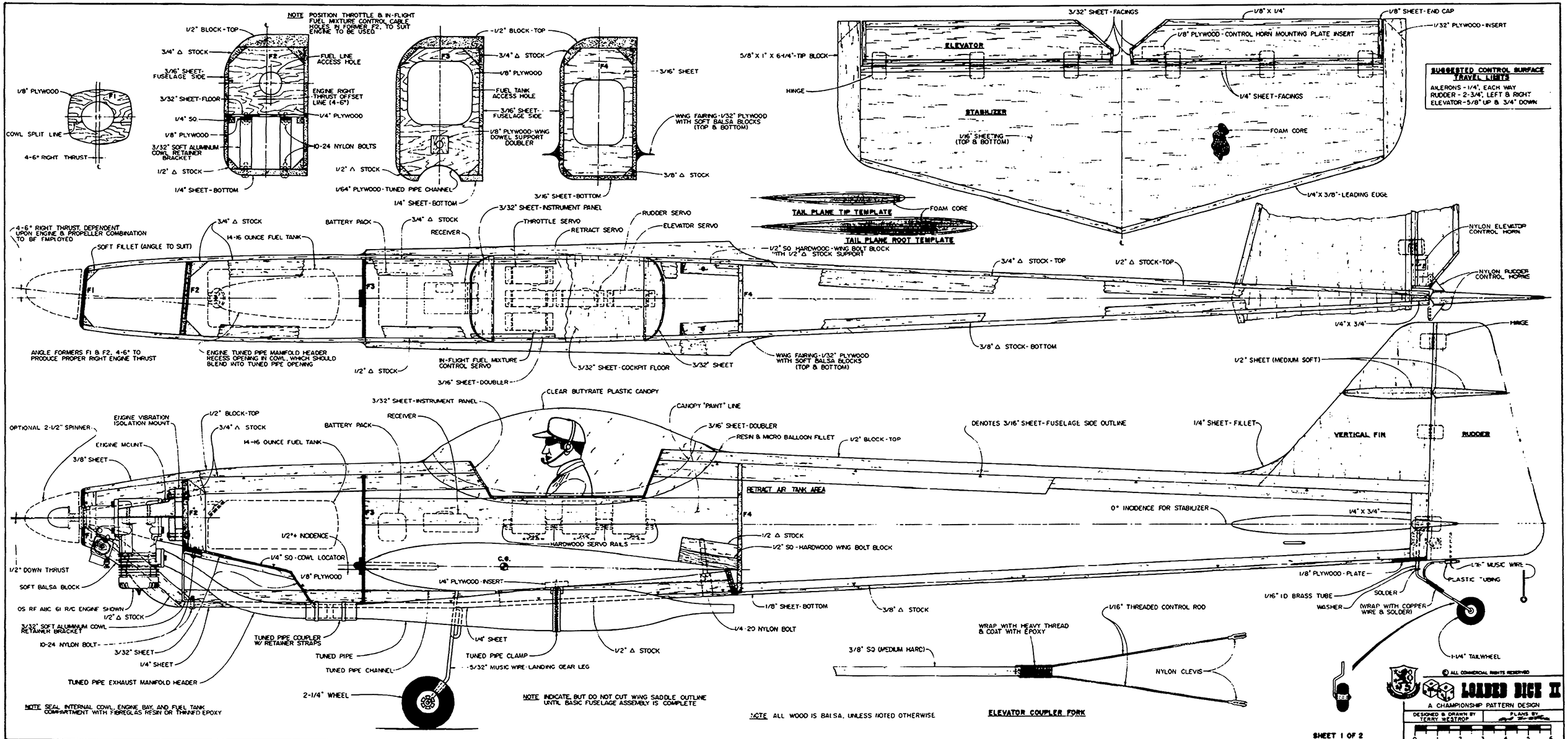
NOTE POSITION THROTTLE & IN-FLIGHT FUEL MIXTURE CONTROL CABLE HOLES IN FORMER F2, TO SUIT ENGINE TO BE USED
1/8" PLYWOOD
F1
COWL SPLIT LINE
4-6° RIGHT THRUST
1/2" BLOCK-TOP
3/4" Δ STOCK
3/16" SHEET-FUSELAGE SIDE
3/32" SHEET-FLOOR
1/4" SQ.
1/8" PLYWOOD
3/32" SOFT ALUMINUM COWL RETAINER BRACKET
1/2" Δ STOCK
1/4" SHEET-BOTTOM
F2
FUEL LINE ACCESS HOLE
ENGINE RIGHT THRUST OFFSET LINE (4-6°)
1/4" PLYWOOD
10-24 NYLON BOLTS
F3
1/2" Δ STOCK
1/64" PLYWOOD-TUNED PIPE CHANNEL
1/4" SHEET-BOTTOM
1/2" BLOCK-TOP
3/4" Δ STOCK
1/8" PLYWOOD
FUEL TANK ACCESS HOLE
3/16" SHEET-FUSELAGE SIDE
1/8" PLYWOOD-WING DOWEL SUPPORT DOUBLER
F4
3/16" SHEET
WING FAIRING-1/32" PLYWOOD WITH SOFT BALSA BLOCKS (TOP & BOTTOM)
3/8" Δ STOCK
3/16" SHEET-BOTTOM
3/32" SHEET-FACINGS
1/8" X 1/4"
1/8" SHEET-END CAP
1/32" PLYWOOD-INSERT
5/8" X 1" X 64 1/4"-TIP BLOCK
ELEVATOR
1/8" PLYWOOD-CONTROL HORN MOUNTING PLATE INSERT
HINGE
STABILIZER
1/16" SHEETING (TOP & BOTTOM)
1/4" SHEET-FACINGS
FOAM CORE
1/4" X 3/8"-LEADING EDGE
SUGGESTED CONTROL SURFACE TRAVEL LIMITS
AILERONS - 1/4", EACH WAY
RUDDER - 2-3/4", LEFT & RIGHT
ELEVATOR - 5/8" UP & 3/4" DOWN
TAIL PLANE TIP TEMPLATE
FOAM CORE
TAIL PLANE ROOT TEMPLATE
4-6° RIGHT THRUST, DEPENDENT UPON ENGINE & PROPELLER COMBINATION TO BE EMPLOYED
SOFT FILLET (ANGLE TO SUIT)
3/4" Δ STOCK
14-16 OUNCE FUEL TANK
BATTERY PACK
3/4" Δ STOCK
RECEIVER
3/32" SHEET-INSTRUMENT PANEL
THROTTLE SERVO
RETRACT SERVO
RUDDER SERVO
ELEVATOR SERVO
1/2" SQ HARDWOOD-WING BOLT BLOCK WITH 1/2" Δ STOCK SUPPORT
3/4" Δ STOCK-TOP
1/2" Δ STOCK-TOP
NYLON ELEVATOR CONTROL HORN
NYLON RUDDER CONTROL HORNS
1/4" X 3/4"
HINGE
3/8" Δ STOCK-BOTTOM
ANGLE FORMERS F1 & F2, 4-6° TO PRODUCE PROPER RIGHT ENGINE THRUST
ENGINE TUNED PIPE MANIFOLD HEADER RECESS OPENING IN COWL, WHICH SHOULD BLEND INTO TUNED PIPE OPENING
1/2" Δ STOCK
IN-FLIGHT FUEL MIXTURE CONTROL SERVO
3/16" SHEET-DOUBLER
3/32" SHEET-COCKPIT FLOOR
3/32" SHEET
WING FAIRING-1/32" PLYWOOD WITH SOFT BALSA BLOCKS (TOP & BOTTOM)
1/2" SHEET (MEDIUM SOFT)
CLEAR BUTYRATE PLASTIC CANOPY
3/32" SHEET-INSTRUMENT PANEL
CANOPY "PAINT" LINE
3/16" SHEET-DOUBLER
RESIN & MICRO BALLOON FILLET
1/2" BLOCK-TOP
DENOTES 3/16" SHEET-FUSELAGE SIDE OUTLINE
1/4" SHEET-FILLET
VERTICAL FIN
RUDDER
OPTIONAL 2-1/2" SPINNER
ENGINE VIBRATION ISOLATION MOUNT
ENGINE MOUNT
3/8" SHEET
1/2" BLOCK-TOP
3/4" Δ STOCK
14-16 OUNCE FUEL TANK
BATTERY PACK
RECEIVER
RETRACT AIR TANK AREA
0° INCIDENCE FOR STABILIZER
1/4" X 3/4"
1/2°+ INCIDENCE
HARDWOOD SERVO RAILS
1/2 Δ STOCK
1/2" SQ-HARDWOOD WING BOLT BLOCK
1/4" SQ-COWL LOCATOR
C.G.
1/2" DOWN THRUST
1/8" PLYWOOD
1/8" PLYWOOD-INSERT
SOFT BALSA BLOCK
OS RF ABC 61 R/C ENGINE SHOWN
1/2" Δ STOCK
3/32" SOFT ALUMINUM COWL RETAINER BRACKET
10-24 NYLON BOLT
3/32" SHEET
1/4" SHEET
TUNED PIPE EXHAUST MANIFOLD HEADER
TUNED PIPE COUPLER W/ RETAINER STRAPS
TUNED PIPE
TUNED PIPE CHANNEL
TUNED PIPE CLAMP
5/32" MUSIC WIRE-LANDING GEAR LEG
1/4" SHEET
1/2" Δ STOCK
1/4-20 NYLON BOLT
1/8" SHEET-BOTTOM
3/8" Δ STOCK
2-1/4" WHEEL
1/8" PLYWOOD-PLATE
1/16" MUSIC WIRE
PLASTIC TUBING
1/16" ID BRASS TUBE
SOLDER
WASHER
(WRAP WITH COPPER WIRE & SOLDER)
1-1/4" TAILWHEEL
1/16" THREADED CONTROL ROD
WRAP WITH HEAVY THREAD & COAT WITH EPOXY
3/8" SQ (MEDIUM HARD)
NYLON CLEVIS
ELEVATOR COUPLER FORK
NOTE SEAL INTERNAL COWL, ENGINE BAY AND FUEL TANK COMPARTMENT WITH FIBREGLAS RESIN OR THINNED EPOXY
NOTE INDICATE, BUT DO NOT CUT WING SADDLE OUTLINE UNTIL BASIC FUSELAGE ASSEMBLY IS COMPLETE
NOTE ALL WOOD IS BALSA, UNLESS NOTED OTHERWISE
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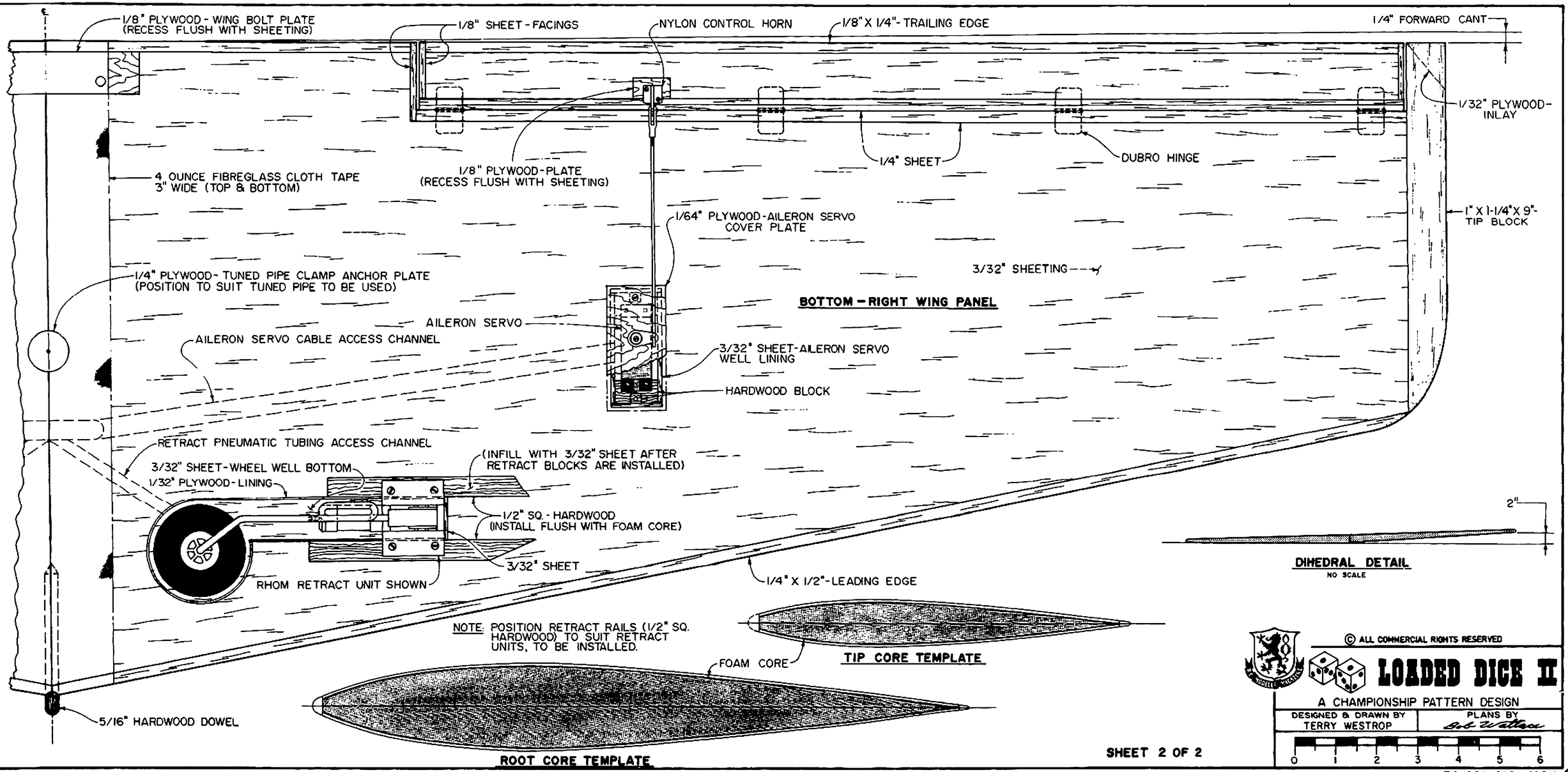
LOADED DICE II
A CHAMPIONSHIP PATTERN DESIGN
DESIGNED & DRAWN BY TERRY WESTROP
PLANS BY
0 1 2 3 4 5 6
SHEET 1 OF 2
PLAN NO. 1180 ②



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LOADED DICE II

A CHAMPIONSHIP PATTERN DESIGN

DESIGNED & DRAWN BY TERRY WESTROP

PLANS BY Bob Wallace

0 1 2 3 4 5 6

SHEET 2 OF 2

PLAN NO. 1180 (2)

LOADED DICE II

Terry's latest pattern ship is a proven winner in F3A!

By Terry Westrop

Twelve years of accumulated knowledge building and flying R/C aerobatic aircraft have been incorporated into the design and development of "Loaded Dice II," and is my perception of how a competition model should look and perform. The configuration of any given design must, to some extent, be influenced by the task asked of it with respect to competition rules. Fortunately for aerobatic pilots, those constraints produce designs that are invariably "user friendly" while remaining extremely accurate in flight.

I recall my first venture into the "elite" 10cc engine class (as it appeared back in the late 70's early 80's), building contest winning designs such as Upset, Super Star, and Curare, finding myself amazed at how graceful and easy they seemed to be to fly. Design and technical advances together with significantly lighter wing loadings enhance still further the qualities of current aerobatic models.

LOADED DICE II

Designed By:
Terry Westrop

TYPE AIRCRAFT
Pattern (F3A)

WINGSPAN
68 Inches

WING CHORD
12½ Inches (Avg.)

TOTAL WING AREA
850 Sq. In. (Approx.)

WING LOCATION
Bottom of Fuselage

AIRFOIL
Symmetrical

WING PLANFORM
Tapered Leading Edge

DIHEDRAL, EACH TIP
1 Inch

OVERALL FUSELAGE LENGTH
64½ Inches

RADIO COMPARTMENT SIZE
(L) 16⅜" x (W) 3⅛" x (H) 2"

STABILIZER SPAN
25 Inches

STABILIZER CHORD (incl. elev.)
8 Inches (Avg.)

STABILIZER AREA
200 Sq. In. (Approx.)

STAB AIRFOIL SECTION
Symmetrical

STABILIZER LOCATION
Center of Fuselage

VERTICAL FIN HEIGHT
7 Inches

VERTICAL FIN WIDTH (incl. rud.)
8 Inches (Avg.)

REC. ENGINE SIZE
.61 2-stroke/.91 4-stroke

FUEL TANK SIZE
14-16 Oz.

LANDING GEAR
Conventional

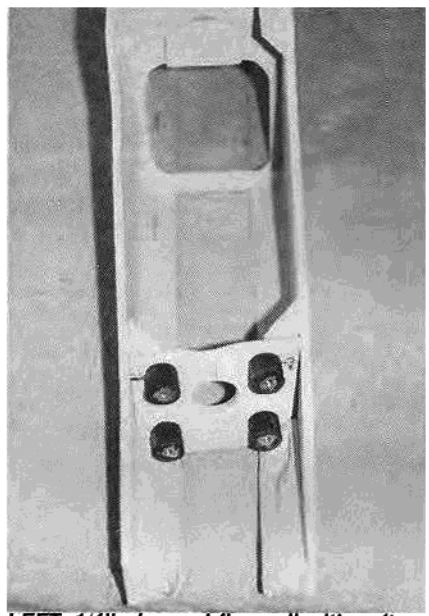
REC. NO. OF CHANNELS
4-(5 w/Retracts)
(6 w/Mixture Cont.)

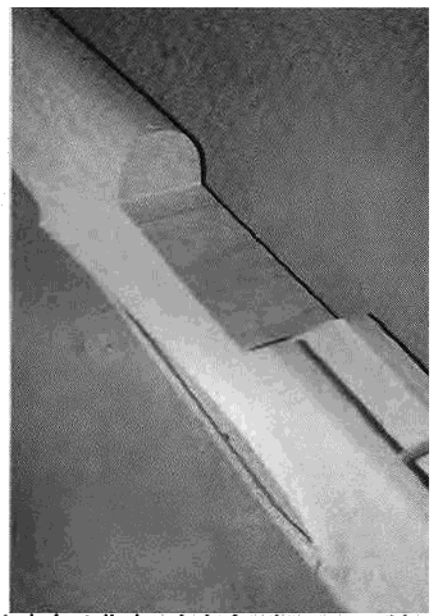
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail., Ret., Mixture Cont.

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa, Ply, Hardwood, Foam Core
Empennage	Balsa & Foam Core
Wt. Ready To Fly	112 Ozs. (7 Lbs.)
Wing Loading	19 Oz./Sq. Ft.

3/16" balsa fuselage sides joined with formers. Note that wing saddle is not cut out at this time.

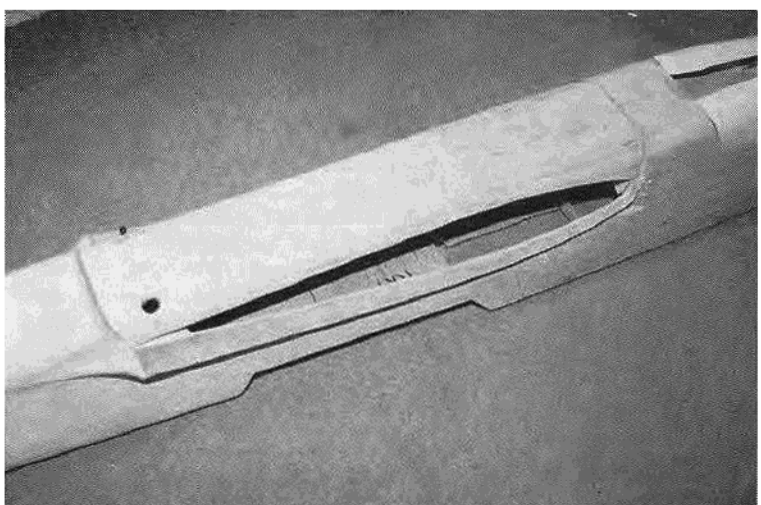


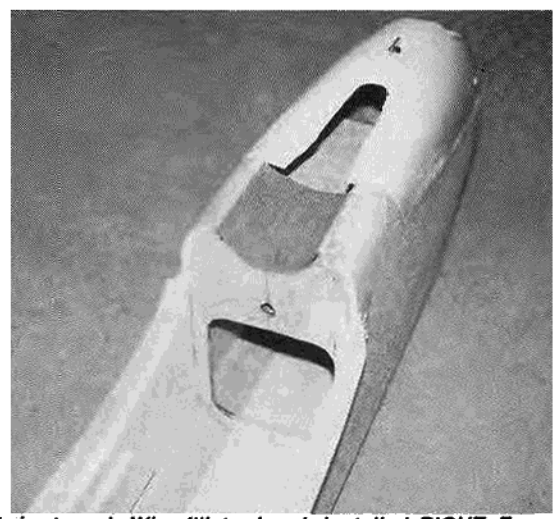


LEFT: 1/4" plywood fire wall with soft mounts is installed early in fuselage assembly. RIGHT: Turtledeck sheeting and cockpit floor are now in place. Top nose block is still to be added.

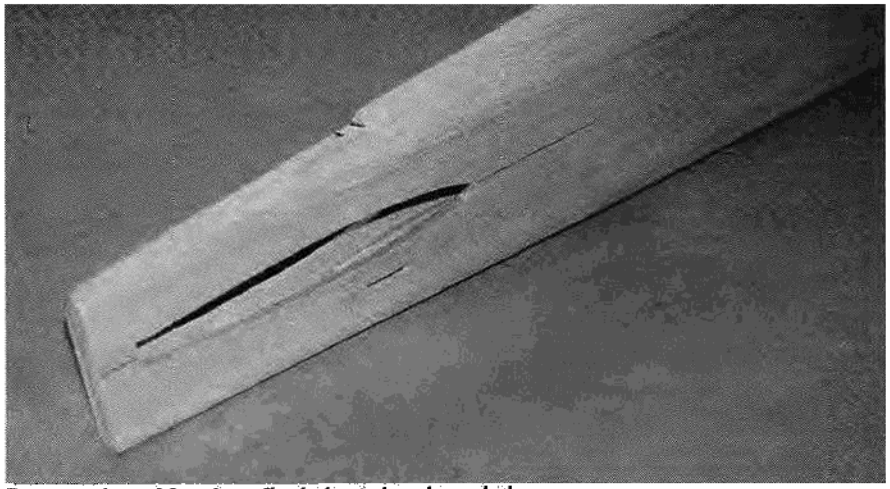
These days there are a considerable number of aerobatic types from which to choose, some present nicely in flight but appear rather bulky in "static pose." I like to believe that with Loaded Dice I have achieved a compromise that is difficult to better at the present time. For me, the primary factor is that the model must be pleasing to the eye and not solely designed around aerodynamics.

Loaded Dice is certainly not just for the purist competition pilot, indeed those longing to try this type of model but feeling just a little apprehensive should not worry. With fixed landing gear and a conservative color scheme, Loaded Dice is easy and quick to construct. Typically weighing in at 7 lbs., even a modest .61 2-stroke (.91 4-stroke) will provide reasonable performance. Naturally, for "competitive" power to weight ratios, one of the more capable (expensive) engines will be worthy

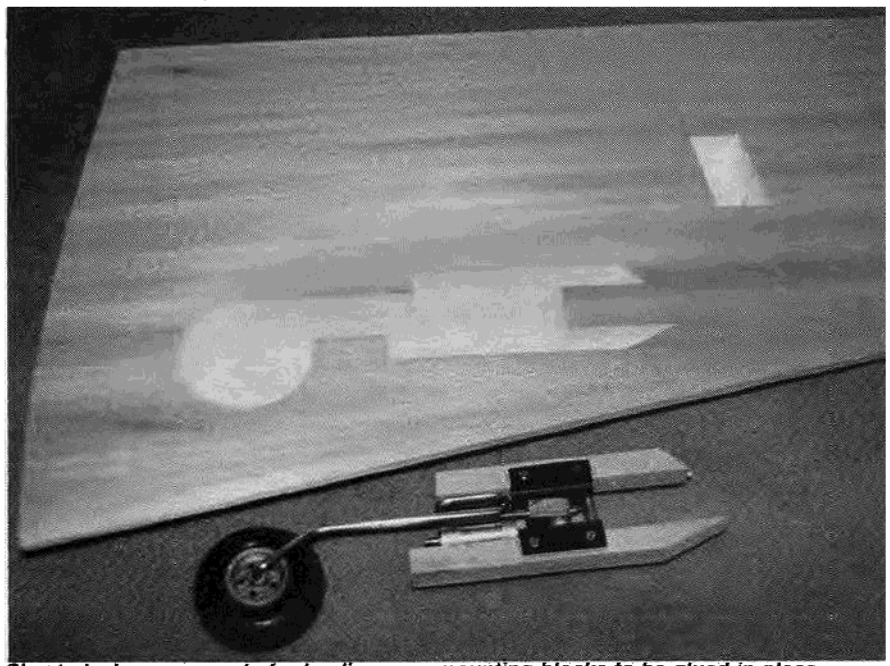




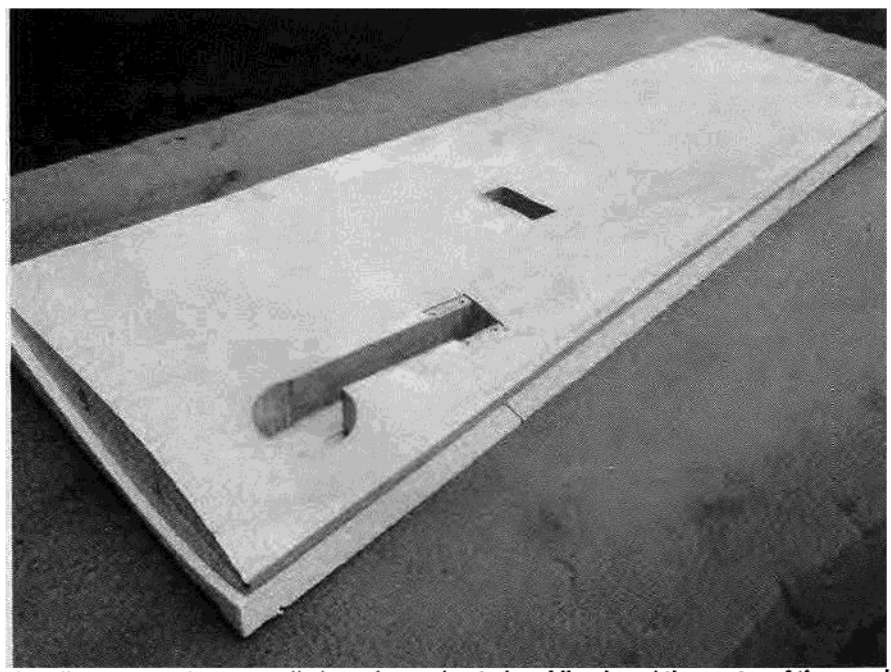
LEFT: Bottom wing cover (pan) and nose section are shaped and ready for tuned pipe trough. Wing fillets already installed. RIGHT: Front cut-out for tuned pipe is sheeted with 1/16 plywood.



Rear section of fuselage final shaped and sanded.



Sheeted wing core ready for landing gear mounting blocks to be glued in place.



Landing gear and servo wells have been sheeted and lined, and the center of the panel grooved for the L.E. dowel.

of consideration.

Some of you will notice I have not employed the current trend of plug-in wing and tail or fully enclosed tuned pipe. There are advantages and disadvantages for both concepts. The most obvious advantage with plug-in systems is to provide more convenient transportation and of course if mistakes are made during construction, rigging angles can be changed quickly. However, the assembled plug-in model is somewhat less robust and often slightly heavier. Plug-in hardware is readily available, and I'm sure adventurous builders who "feel the need" will have no difficulty in modifying Loaded Dice accordingly.

Basically "Loaded Dice II" is a larger more elegant version of my previous design (Nov. 1991, Plan #1104), and extracts full advantage of the new generation low revving engines in further reducing noise.

CONSTRUCTION

It will become apparent from the plan that the basic building technique is very straightforward. Following the procedure listed, I believe, produces a Loaded Dice in the shortest possible time. Naturally, some builders, particularly those with considerable experience, will have there own proven methods. These instructions will benefit those using Loaded Dice as their first "real" aerobatic project. Each will have preferred adhesives depending on speed of building or time available to spend on a project. PVA (white glue) is economical and light, epoxy is heavy and expensive, CA is very expensive. Unless stated otherwise, PVA would be my preference.

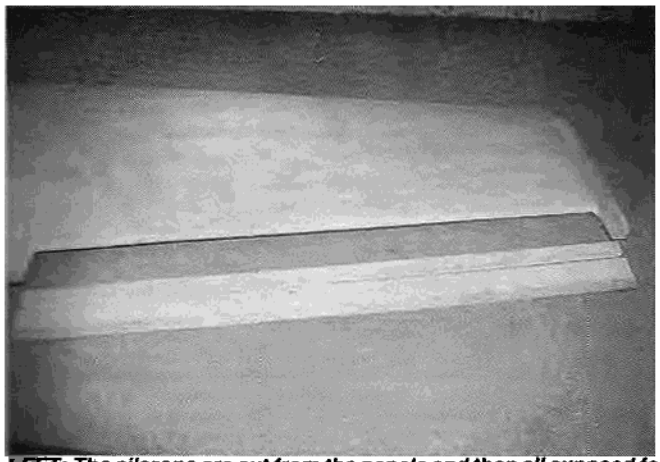
The majority of modelers have a natural tendency to "overbuild," i.e., ensure the finished project will survive almost any impact. Worth remembering is that heavy models impact more severely and are certainly less pleasant to fly. The general balsa density recommended is of the soft to medium variety unless noted otherwise. Those wishing to film cover entirely may consider not incorporating wing fillets, in which case 1/32" ply doublers should be attached on the inside of the wing saddle area using slow CA.

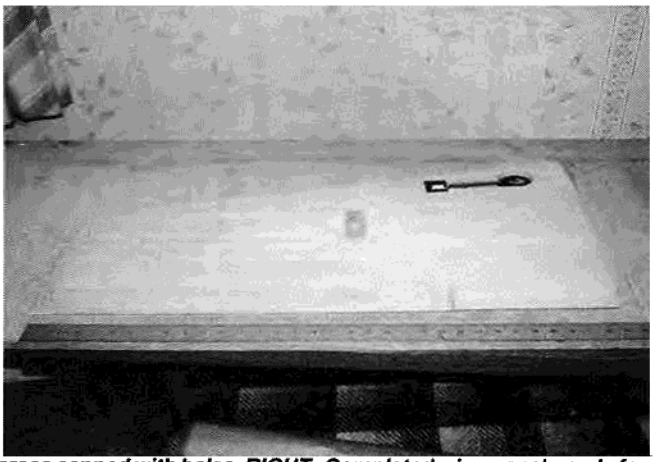
Wing/Tail:

The veneered foam panels are edged with 1/4" balsa. Mark out and recess to suit landing gear units and servo well. The servo wells shown will accommodate the "mini" types installed vertically for accessibility, modify accordingly if intended equipment differs. Bore 1/2" access holes for servo cables, etc. Epoxy in place the landing gear bearers.

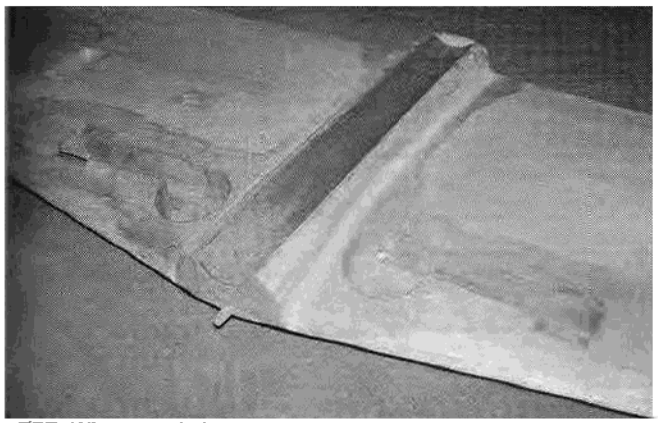
Fuselage:

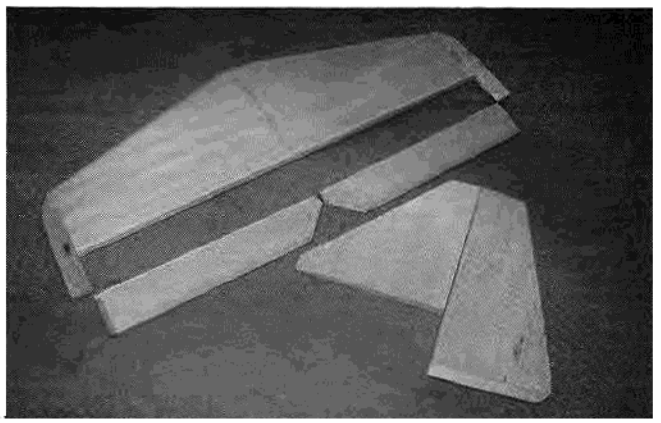
Produce left and right "matched" sides to full profile, i.e., not cutting out the wing section at this stage. At this point, draw around the wing root on the outside along with all datums for future reference. On a flat surface, fix in place all longerons and doublers. Make formers F3 and F4.





LEFT: The ailerons are cut from the panels and then all exposed foam areas capped with balsa. RIGHT: Completed wing panel, ready for joining.





LEFT: Wing panels have been joined and the bottom pan installed. Trough is sheeted with 1/64" plywood. Note glassed areas around retracts and bottom pan/fillets. RIGHT: Vertical fin and rudder are light balsa. Horizontal stabilizer is foam core with balsa sheeting.

Wing:

Clean up the landing gear wells and epoxy 1/32" plywood lining and 3/32" balsa floor in place. Sand panels and add tip blocks.

Fuselage:

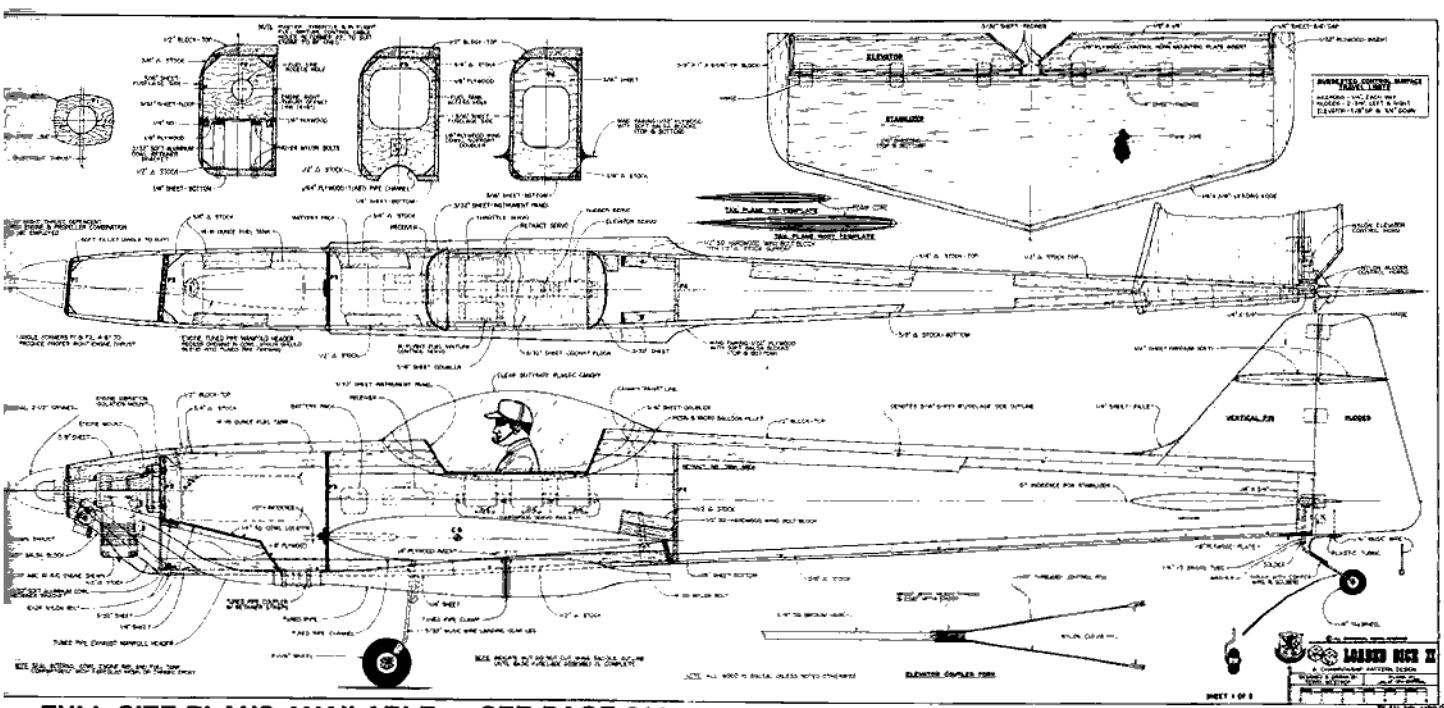
Fit F3 and F4, make F2 to suit engine and mount providing access for fuel lines, throttle linkage, etc. Worthy of consideration at this point is the use of soft mountings. These are simple to install and highly recommended for those interested in reducing noise.

Tail:

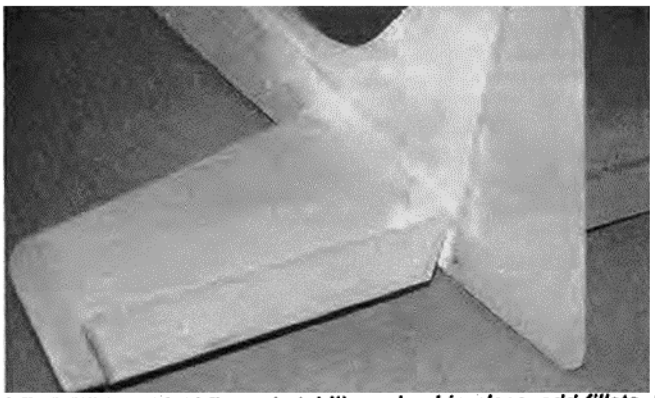
Sand edging and add tip blocks.

Wing:

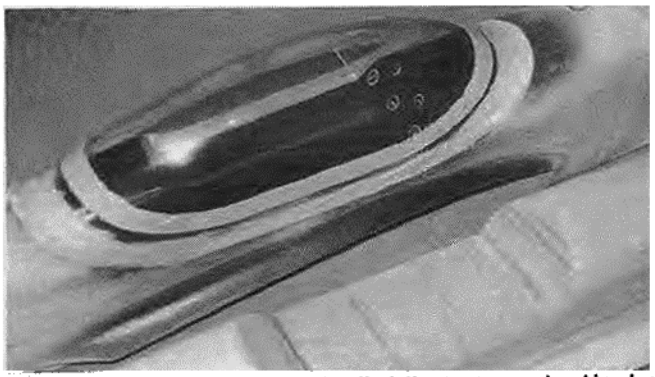
Sand entirely and mark exit point for the 1/2" access holes on the top surface. Sand wing roots (8" flat block and 80 grit paper), for correct dihedral, groove L.E. for 5/16"



FULL SIZE PLANS AVAILABLE — SEE PAGE 211



LEFT: With vertical fin and stabilizer glued in place, add fillets. RIGHT: Fill, prime, and sand fuselage in preparation for painting.



LEFT: Cockpit area is painted, detailed, then canopy glued in place and fillet added. RIGHT: Cowling can be built-up balsa, then glassed or made from fiberglass totally. Note right offset in engine. Very clean!

continued from page 103

dowel and epoxy panels together.

Fuselage:

Install F2 incorporating appropriate right and down thrust.

Wing:

Sand the ply plates at the center section flush and reinforce using 3'' tape. Polyester finishing resin (K&B or Sig are preferred), provides an excellent adhesive. Incorporating a little microballoons as a sanding medium, two coats should suffice, well flattened between each coat. Sand using 80 grit initially, then 180 to finish and the joint will be almost invisible.

Fuselage:

Sand top and bottom. Add all bottom sheeting and plywood tail wheel plate. Reinforce fire wall with 3/4'' triangle stock and fit cockpit floor only to maintain rigidity during further working.

Tail:

Using a sharp blade remove elevators, sand gently, and attach 1/4'' edging.

Fuselage:

Install engine, align and fix nose ring. Add 1/2'' sheet to the top and bottom of engine bay, leaving only the tank bay clear at present. Add the 1/2'' sheet rear turtledeck.

Fin/Rudder:

Select some straight, light 1/2'' sheet, shape and section to around 1/4'' at the tips.

Fuselage:

Shape and sand fuselage bottom to finish. Remove the cowl and add tank bay floor and facing. Check that the wing section is correctly drawn on the sides and carefully remove this area. Razor saw at F3 and F4, and remove the underpan. Sand level at F3, offer up the wing to check L.E. centerline and drill for 5/16'' dowel. Add 1/2'' hardwood bolt blocks and triangle backing.

Tail:

Blend 1/4'' edging and attach 1/8'' facings.

Fuselage:

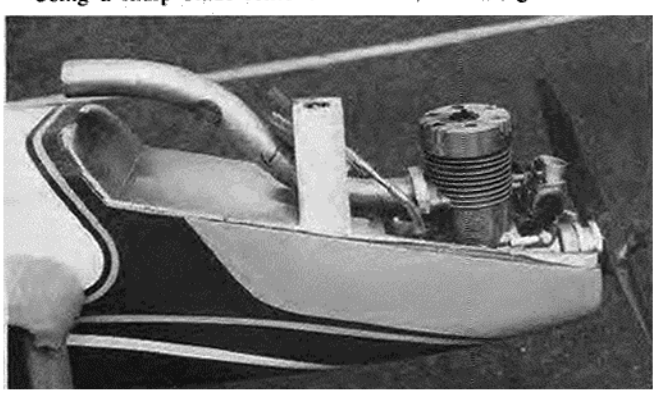
Carefully cut 1/2'' triangle (full length) from the edges of the rear turtledeck. Later, this will be used for the wing fairing filler (waste not good balsa). Align the wing on the fuselage and, when satisfied, drill through the assembly. Thread the bolt blocks to suit bolts (1/4-20 nylon have proved adequate). Protect the area of the wing adjacent to the fuselage sides with tape or film and bolt together. Lay on the 1/32'' ply fairing base and fix in place using the triangle stock infill. Add 1/8'' sheet to the lower rear fairing flush with the T.E. Fit rear fuse. facing/subformer in front of F4.

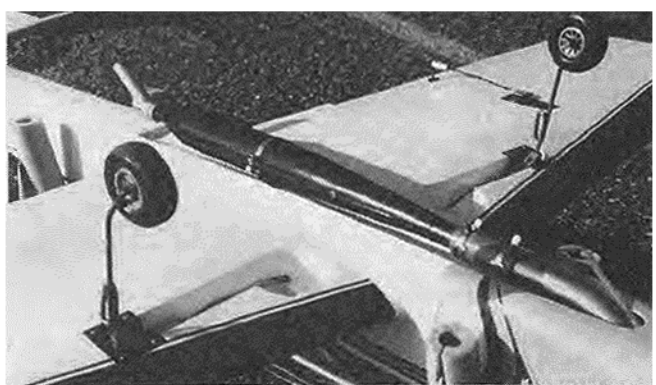
Tail:

Sand entirely, recess elevators for the 1/8'' plywood horn plate and insert 1/32'' plywood tip protectors. Sand roots for 0° dihedral and epoxy together.

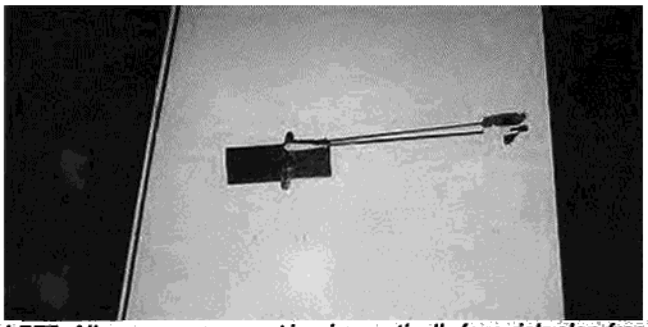
Wing:

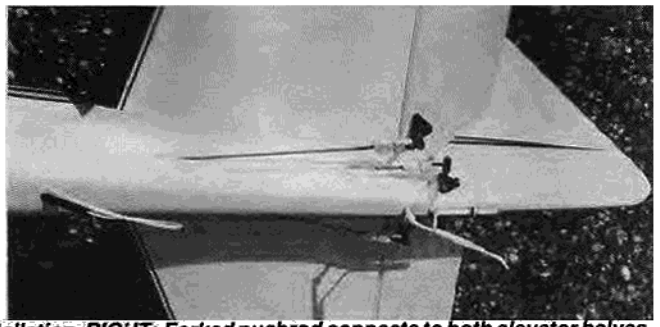
Make plywood wing bolt and pipe anchor plates. Make recesses in wing and epoxy in





LEFT: Single screw or Dzus Fastener provides quick access to engine compartment. RIGHT: Tuned pipe set-up is very clean and accessible.





LEFT: Aileron servos mount in wing vertically for quick, slop-free installation. RIGHT: Forked pushrod connects to both elevator halves. Pull-pull cables operate rudder. Note antenna exit on bottom of fuselage.

place.

Fuselage:

Join at the tail post, ensuring a straight run either in a jig or by placing pins centrally in F3 and F4, and at the tail post. Viewing from front to back, align all three pins. If there is an error, saw halfway through triangle longerons at strategic points along the stiffest side until correct.

Carefully sand the underpan to size and attach facings. Once dry, fix to the wing using polyester resin, CA, or epoxy, providing access to the bolts. Mark and remove the area that is to accommodate the pipe channel including that below the tank bay. Cut the 1/64'' plywood grain longways, well oversize and bend into place, touching the wing's lower surface at the shallowest point. When dry, sand level, razor saw through at F3 and remove wing. Fuelproof and reinforce the inside tank bay with polyester resin and fiberglass; add 1/2'' front top deck.

Wing:

With sharp blade, remove the ailerons, and gently sand. Attach 1/4'' edging, ensuring that the ailerons remain true and flat while drying.

Fuselage:

Shape and sand the top deckings, complete the cockpit facing, and assemble the wing on the fuselage. Install the stabilizer and check relative incidence. The wing should be in the region of 1/2° positive (incidence meters are helpful). Adjust if necessary and glue the stabilizer in place. When dry, the fin can be attached, again being as accurate as possible; a pin placed centrally in the decking above F4 and viewed from front to rear, aligned centrally with the fin, will help ensure accuracy.

Wing:

Sand 1/4'' edging, recess ailerons for the 1/8'' ply horn plates, complete facings and insert 1/32'' plywood tip protectors.

Fillets:

To produce fillets of high quality around the tail, canopy, or to finish off the wing fairing, a mix of polyester resin and microballoons will sand in easily. To assist in the formation of the various fillet shapes, Ace R/C carries Perma-Grit™ sanding tools that are available in flat, round, or curved sanders. You'll be surprised how quick and easy it is to achieve the required effect.

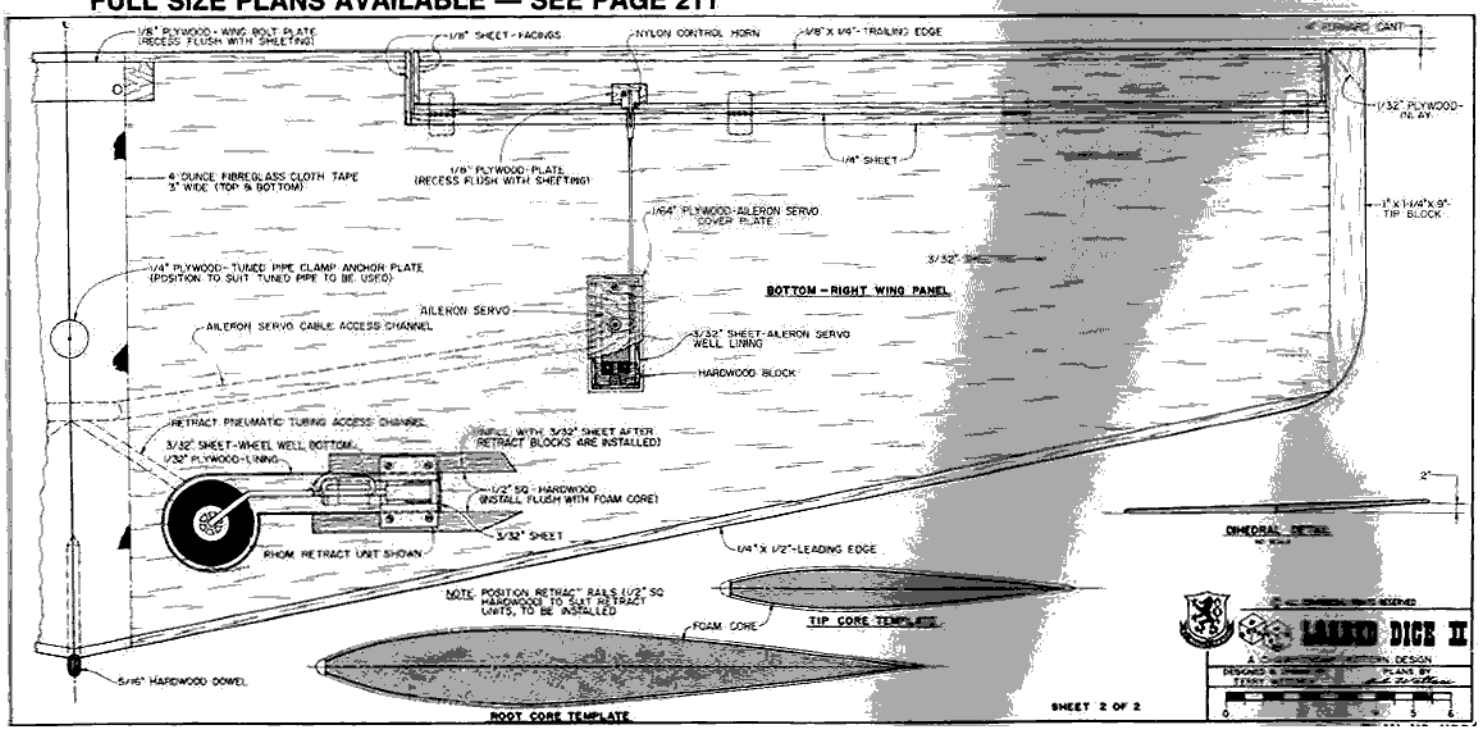
FINISH

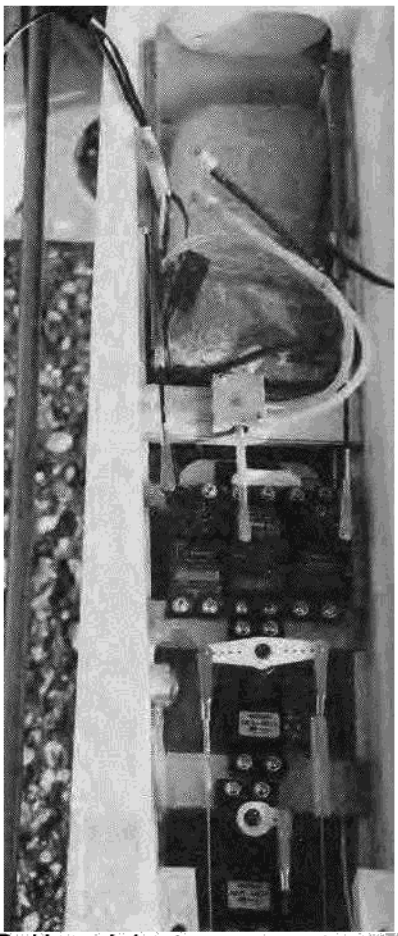
A paint job is not absolutely essential but can really enhance the appearance of a Loaded Dice fuselage. Possibly the lightest and most durable system is a combination of 3/4 oz. glass cloth and polyester resin, thinned on the first application and then a full strength coat incorporating some microballoons. This can then be sanded quite severely with anything up to 80 grit and finished with 180. An even better surface can be achieved with yet another thinner coat of resin.

Lightly sanded, the fuselage then requires primer, cockpit decor, and canopy attachment using epoxy (rough-up all contact areas first). My models almost always have a two-part color system such as K&B. The flow and build characteristics are unsurpassed and it's fuelproof. Plastic lining tape in 1/8'' and 1/4'' widths is used to achieve the effect on the original Loaded Dice, stars are placed on prior to painting, then removed afterwards.

Wing and tail weight must be minimized, but still achieve a comparable standard of finish, as on the fuselage. Obvious choice here has got to be an iron-on film. A mixture

FULL SIZE PLANS AVAILABLE — SEE PAGE 211





Rudder and elevator servos are mounted in tandum, in front are mixture control, retracts, and throttle. Air tank for retracts is mounted in fuselage behind elevator servo.

of Solarfilm, Solarspan, and Solartrim were used to produce the color scheme of the original Loaded Dice. Solarfilm has a huge range of color shades to match almost any paint. Finally, mylar around 3/4" width and slow CA as adhesive will assist in obtaining that gapless hingeline so important for smooth airflow.

RADIO INSTALLATION

There is ample room for any type of R/C equipment. The photos show the most convenient arrangement. If air retracts are fitted, the reservoir can be installed in the turtledeck at the rear of the canopy (ensure there are no leaks first). Almost any fuel tank up to 16 ozs. will be accommodated in tank bay and, if necessary, there is also space for the NiCd. Throttle linkage is accomplished using a snake such as Sullivan. Lightweight closed loop (pull/pull) system operates the rudder, and a "Y" rod allows accurate adjustment and positive response for the elevators. Ailerons are quite straightforward, particularly when using mini-servos installed vertically — connected to the Rx via a "Y" lead, as differential is rarely a problem and flaperons unnecessary. The tail wheel may seem unduly high, but keep it if possible as it does make ground handling, take-off, and landing much easier.

SURFACE THROWS

The follwing deflections can only be a guide, each pilot will have a particular "feel" and adjust accordingly.

Elevator — +5/8", −3/4"
Aileron — +1/4", −1/4"
Rudder — +2¾", −2¾"

C.G.

One benefit with such low wing loading is that the balance point becomes less critical. Loaded Dice will exhibit no major drawbacks 1/2" either side of the optimum position shown on the plan. Naturally, control response will become more lively on the rearward side, and the reverse as the model becomes nose heavy.

BASIC TRIMMING

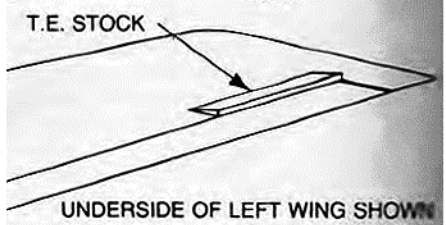
If it is desired to progress beyond the "sport flying" arena, not necessarily with intentions towards competition but simply wishing to test the limits of model or pilot's ability, the following brief procedure will enable the pilot to at least begin trimming the aircraft.

First stage is to ensure consistent engine performance and set the control "feel" to suit the operator.

With engine at idle and around 600 feet altitude, check vertical downlegs; if the model shows a marked tendency to pull out, not holding the line, recheck the C.G. and relative incidence between the wing and tail. The more forward the C.G., generally, the more apparent this problem becomes and, therefore, can be corrected to some extent by moving the balance point rear. Wing incidence increase can also help.

Next, pull a vertical line (engine at full throttle naturally), hands-off for 600' or so and notice any heading changes. Noticeable deviations to the left (in yaw) are almost certainly a result of insufficient right thrust (that'll teach you to stick to the plan in the future), and is the most common problem encountered. It's not entirely essential to alter the sidethrust; indeed some find comfort in the fact that if any yaw correction is required during flight, it will almost always be right rudder. I prefer the model in "neutral" set-up, hence the amount of offset designed in. If down elevator is required to hold vertical, it may be necessary to increase downthrust (assuming the incidence and C.G. checked good).

If in either of the previous exercises the model rolls slightly of its own accord, in all probability there is a warp. When roll amounts are small, a cure can be effected using a "trim tab" (see diagram). Example: If the roll is to the right, a piece of T.E. stock, say 3/16" x 3/4" x 4" long should be placed under the left wingtip.



Wing balance can be analyzed during loops or sharp corners, basically adding weight to the wingtip closest to the center of the loop. For those somewhat more advanced on trimming matters, it will be necessary to make minor alterations to wing weight and trim tab until a compromise is achieved.

Aileron differential is seldom a major problem with current F3A designs; however, the test is quite simple to carry out and even easier to correct if the servos have been installed vertically as shown on the plan. Pull the nose up to something like 45° and perform four or five consecutive rolls, to the right. If there is a heading change to the left, differential may be required and can be achieved by increasing the amount of up aileron movement, rotating the servo arm one spline should be ample.

FLIGHT AND TRIMMING

Even the most modest radio equipment now appears to have comprehensive program facilities which, when applied correctly can transform the flight characteristics of any model. In some cases, building inaccuracies that invariably affect performance can be "electronically" rectified, to some degree at least, depending on the scale of the error(s). Almost all operators have knowledge of basic programming such as ATV (travel adjustment). Search through the menu (or even the dreaded instruction manual) and locate a "free mix," often under programmable mix. There could be any number available; two or three on the

Futaba FP7, five on the JR PCM 10, and sufficient to satisfy the most critical (or the worst) builder. Once located, we need an example:

Rudder effect, probably the more common problem. If rudder input results in roll, say right rudder produces left roll, okay. This really means you have insufficient dihedral. In previous years, this entailed a traumatic process of cutting the wing and resetting, and still the dihedral may not be perfect. Now a mixer can be located, rudder is given priority, and aileron slave (displayed as RUDD----AIL). Depending on the severity of roll, dial in around 10% aileron mix, same direction as rudder, i.e., in this case right aileron. Percentages could well vary for left and right rudder.

Obviously, if rudder produces roll in the same direction, there is too much dihedral, requiring opposite aileron input.

The next, most frequent problem, again as a result of rudder deflections, is "pitching" (diving or climbing), and once again can be eliminated using a second mixer. Rudder is the cause of the problem and, therefore, priority with elevator as slave in this case (RUDD----ELEV). Taking a left rudder command, note effects — if the model pitches down, obviously there is a need for some up elevator mixing, as before start with 10%, then try right rudder and adjust accordingly.

If there is another mix available or perhaps the previous options are not in operation, how about trim discrepencies in loops? Does the wing roll consistently in the same direction when elevator is applied? Should be getting a little clearer at this stage, say up elevator always produces a left roll (not a lot), elevator is priority and aileron slave (ELEV----AIL), around 5% maximum, right aileron mix, anything more really means more time should have been spent during building.

This type of programming can have various applications and can certainly make the difference between and average model and a very capable one.

However, mixing is at best simply a compromise, although an essential ingredient, for today's F3A aerobatic pilot. The bottom line still demands a sound design, constructed accurately (and a little practice of course). "Pattern ship" is a term I tend to associate with the old F3A types, "point and squirt" missiles that seemed to utilize the airspace over two counties while realigning for each maneuver.

Indeed, some of those "old" designs have adapted surprisingly well in today's FAI sequences intended to simulate full-size aerobatics. Although the new schedules are quite definitely a step in the right direction, I feel the "powers that be" lack the imagination and creativity to produce a sequence more appropriate for model aerobatic pilots (and spectators).

Now you have the opportunity of flying one of the best models available to cope with the current FAI programs, avoiding high-tech features and remaining within the capabilities of reasonably competent builders. Loaded Dice is a design capable of flight display in a manner most pleasing to the eye, now it's down to you to please the judges. □

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