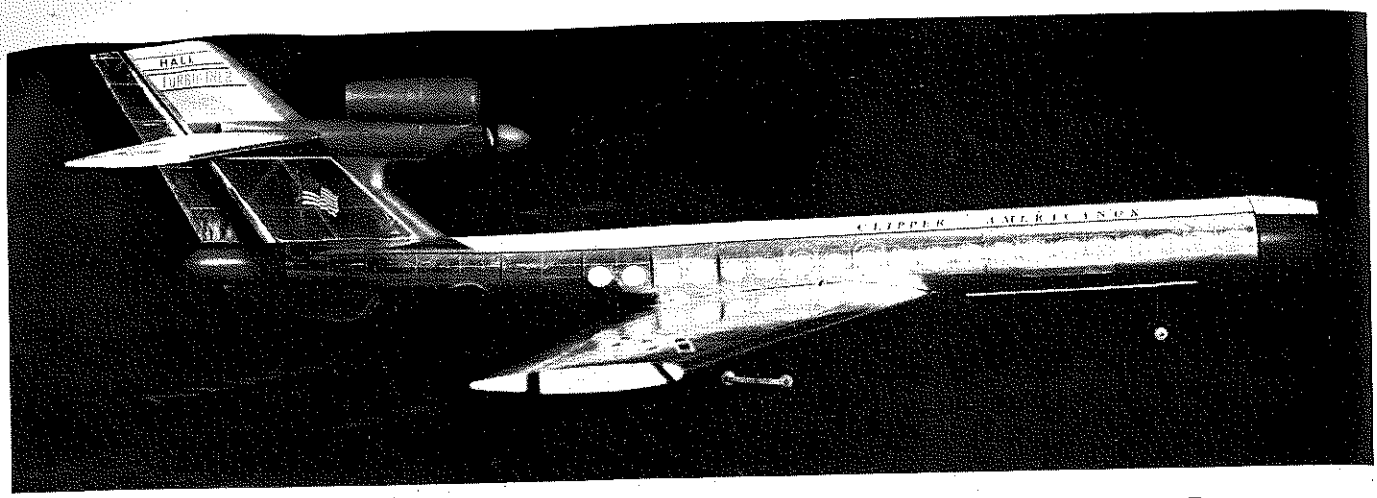
PHOTOS BY THE AUTHOR



CLIPPER AMERICANUS

By ART HALL . . . Something really different for the sport R/C flier who wants a model that looks like an up-to-date aircraft rather than a clougey "trainer" . . . yet has the stability and flying ease of a trainer.

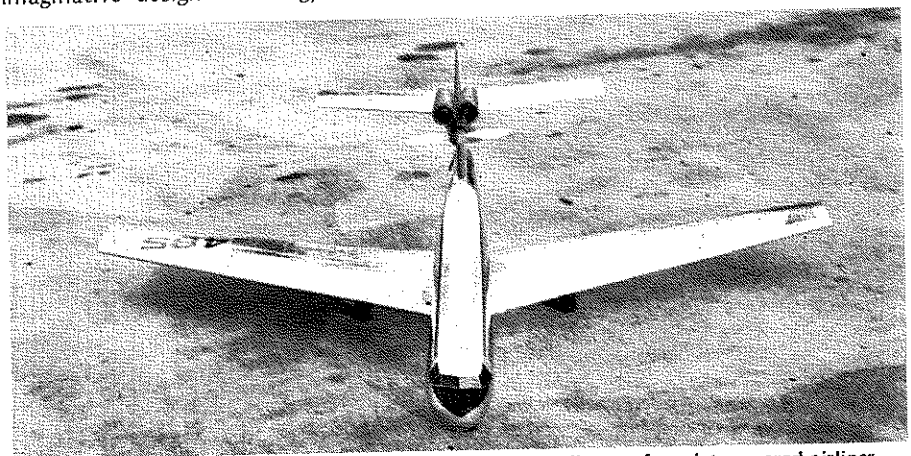
• A-mer-i-ca'nus (-ka'nus). n. One thing American.-Hall. A contribution to promote independent, imaginative and creative design philosophy for model builders and to commemorate the majestic beauty of American-designed, modern jetliners.

With many years experience in free flight/scale designing, building and flying, I am another slow starter in R/C flying. Flying with 1 and 2 channel equipment in .049 powered models was a start. My primary trainer had been an original design, square bodied, transport type model. She has performed for over 22 years as a free-flight, pre-determined control test bed, and R/C trainer. Her career almost equals the Ford Trimotors of Island Airways! The old trusty workhorse was getting heavy and weary so she was "retired" honorably to fly on forever hanging from the ceiling. Time for a new aircraft, and the next logical step was to get into aileron and throttle operation. Attempts to transition on my son's typical .35 low wing "bomb" soon convinced me that I needed a more docile and manageable trainer/workhorse of my very own.

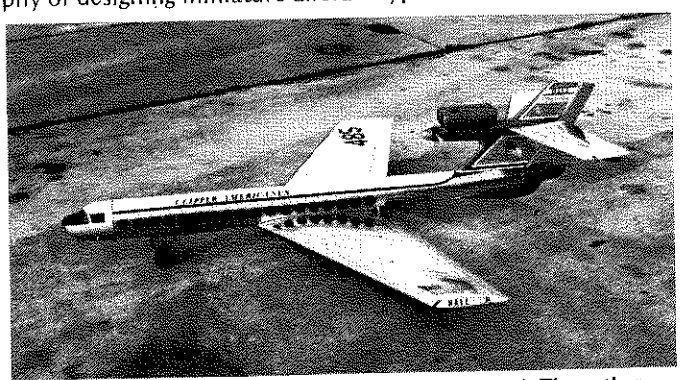
This need for an aileron and throttle trainer was mixed with my old philosophy of designing miniature aircraft types rather than "just models." A keen appreciation of America's sleek and majestic jetliners led to the design and development of the Turboliner "Clipper Americanus." The design of an "any jet" type transport involved a simultaneous solution to the problem of a powerplant since there are no practical and realistic jet engines available. A turbo-prop using standard model engines seemed most workable, yet the muffler sticking out the side was also a problem. With some imaginative design doodling, the twin-turbine, turboprop power package was evolved.

"Clipper Americanus" uses this power package and features the swept-back, sleek modern look accentuated by rivet-detailed metal foil covering and a modern all-flying stabilator.

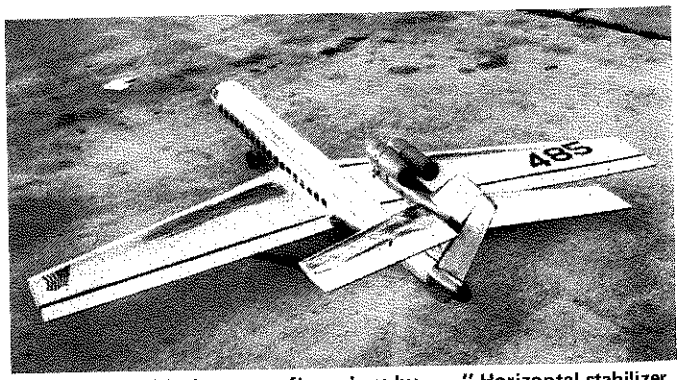
For initial flight tests, the prototype carried 4 channels; the three primary flight controls plus throttle. It was soon determined that it was a stable and controllable aircraft without rudder control. This permitted use of lightweight, 3-



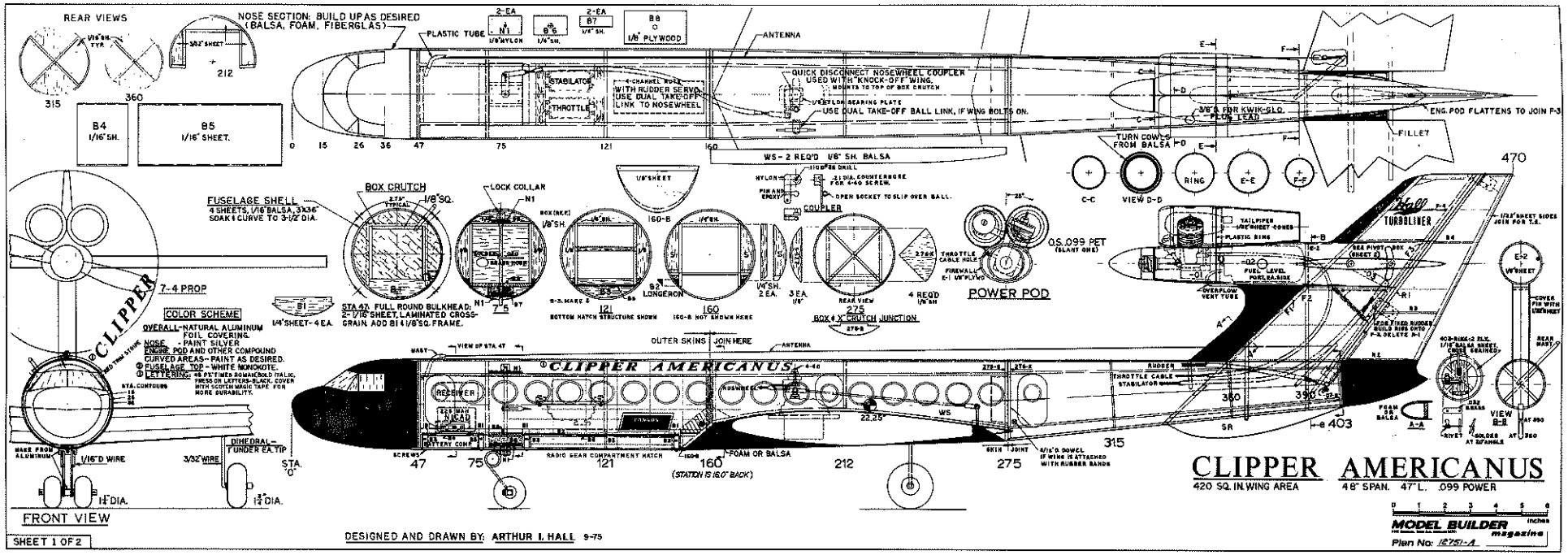
Without that propeller, the "Clipper Americanus" could easily pass for a jet-powered airliner. The metal foil covering completes the image.

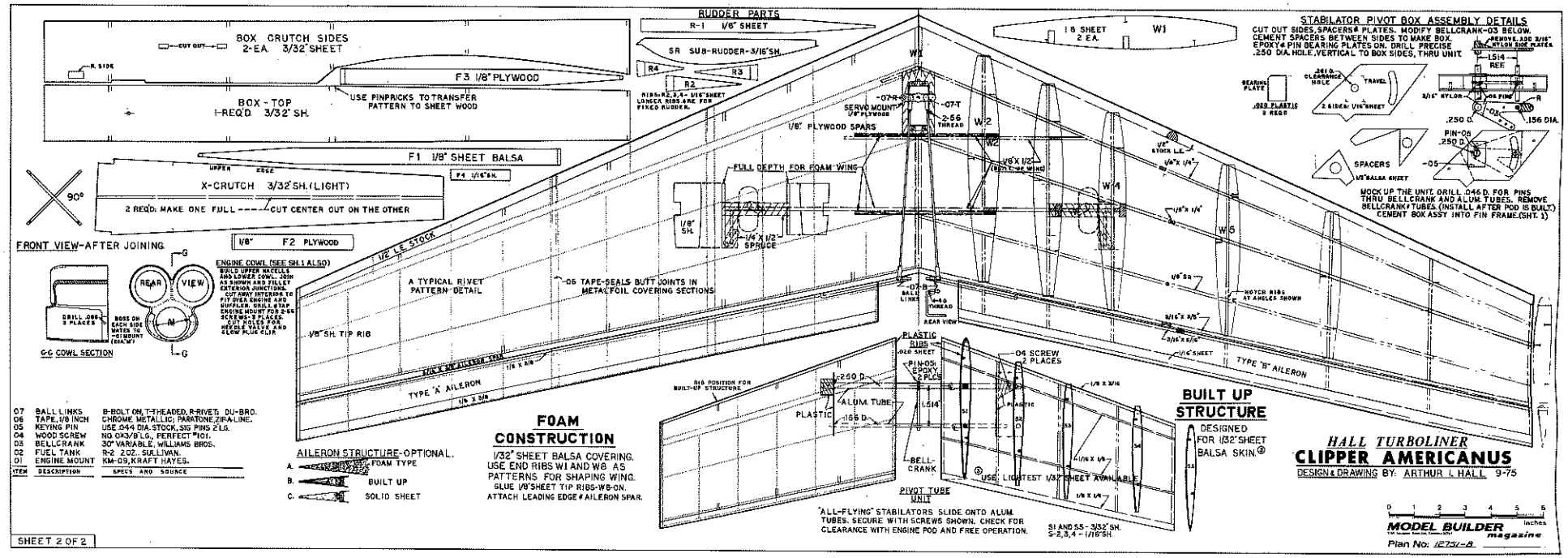


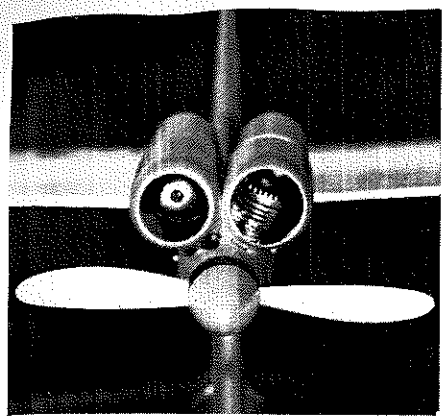
The "Clipper" flies well with or without rudder control. The author wanted something easy to fly that looked different. He has it!



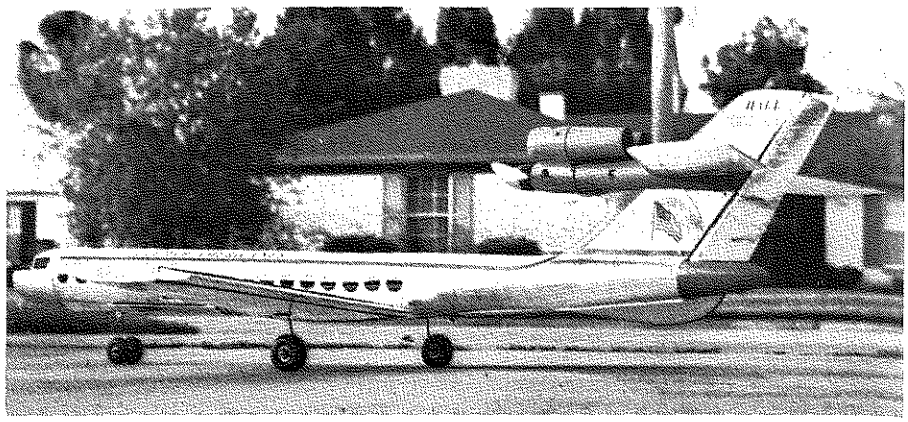
"Guests on this show were flown here by . . . " Horizontal stabilizer is all-moving, but surprisingly non-sensitive.


REAR VIEWS
NOSE SECTION: BUILD UP AS DESIRED (BALSA, FOAM, FIBERGLAS)
PLASTIC TUBE
ANTENNA
STABILATOR
THROTTLE
4-CHANNEL MOD WITH RUDDER SERVO USE DUAL TAKE-OFF LINK TO NOSEWHEEL
QUICK DISCONNECT NOSEWHEEL COUPLER (1) USED WITH "KNOCK-OFF" WING. MOUNTS TO TOP OF BOX CRUTCH
USE DUAL TAKE-OFF BALL LINK, IF WING BOLTS ON.
B4 1/16" SH.
B5 1/16" SHEET.
WS - 2 REQ'D 1/8" SH. BALSA
TURN COWL FROM BALSA
FILLET
ENG. POD FLATTENS TO JOIN F-3
FUSELAGE SHELL
4 SHEETS, 1/16" BALSA, 3"X36" SOAK & CURVE TO 3-1/2" DIA.
BOX CRUTCH
LOCK COLLAR
COUPLER
POWER POD
O.S. .099 PET (SLANT ONE)
TURBOLINER
TAILPIPER
FUEL LEVEL POPPET BA-SIDE
OVERFLOW VENT TUBE
7-4 PROP
COLOR SCHEME
OVERALL - NATURAL ALUMINUM FOIL COVERING.
NOSE - PAINT SILVER
ENGINE POD AND OTHER COMPOUND CURVED AREAS - PAINT AS DESIRED.
FUSELAGE TOP - WHITE MONOKOTE.
LETTERING: 48 PT TIMES ROMAN BOLD ITALIC, TRIM OR LETTERS - BLACK. COVER WITH SCOTCH MAGIC TAPE FOR MORE DURABILITY.
STA. 47 FULL ROUND BULKHEAD. 2-1/16" SHEET, LAMINATED CROSS-GRAIN. ADD B1 & 1/8" SQ. FRAME.
B1 1/4" SHEET - 4 EA.
B2 LONGERON
4 REQ'D 1/8 SH
BOX # X CRUTCH JUNCTION
OUTER SKINS JOIN HERE
CLIPPER AMERICANUS
RECEIVER
BATTERY COMP.
RADIO GEAR COMPARTMENT HATCH
FOAM OR BALSA
(STATION IS 160 BACK)
SKIN JOINT
3/16" D DOWEL IF WING IS ATTACHED WITH RUBBER BANDS
RUDDER
THROTTLE CABLE
STABILATOR
SR
WS
DIHEDRAL - UNDER EA. TIP
MAKE FROM ALUMINUM
1/16" D WIRE
3/32" WIRE
1" DIA.
3/4" DIA.
FRONT VIEW
STA. 0
47
75
121
160
212
275
315
360
390
403
470
CLIPPER AMERICANUS
420 SQ. IN. WING AREA
48" SPAN. 47" L. .099 POWER
DESIGNED AND DRAWN BY: ARTHUR I. HALL 9-75
MODEL BUILDER magazine
Plan No: 1275-A
SHEET 1 OF 2

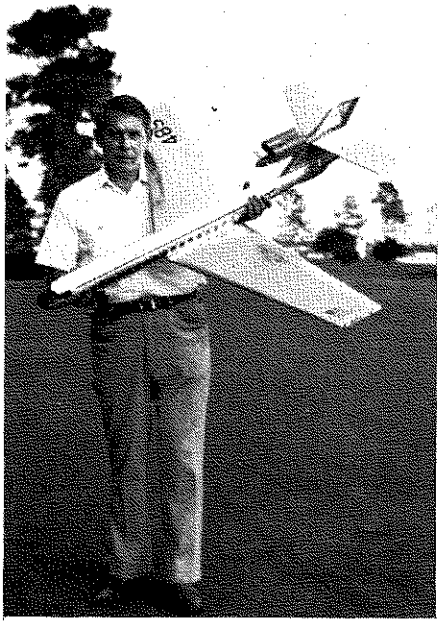

BOX CRUTCH SIDES 2-EA. 3/32" SHEET
BOX - TOP 1-REQ'D. 3/32" SH.
USE PINPRICKS TO TRANSFER PATTERN TO SHEET WOOD
F3 1/8" PLYWOOD
F1 1/8" SHEET BALSA
X-CRUTCH 3/32" SH. (LIGHT)
2 REQ'D: MAKE ONE FULL ---- CUT CENTER OUT ON THE OTHER
90°
F2 PLYWOOD
FRONT VIEW - AFTER JOINING
G-G COWL SECTION
ENGINE COWL (SEE SH. 1 ALSO)
RUDDER PARTS
R-1 1/8" SHEET
SR SUB-RUDDER - 3/16" SH.
RIBS R2, R3, R4 - 1/16" SHEET LOWER RIBS ARE FOR FIXED RUDDER.
1/8" PLYWOOD SPARS
FULL DEPTH FOR FOAM WING
1/8" SH.
1/4 X 1/2 SPRUCE
1/2 LE STOCK
A TYPICAL RIVET PATTERN DETAIL
-05 TAPE-SEALS BUTT JOINTS IN METAL FOIL COVERING SECTIONS
1/8" SH. TIP RIB
TYPE 'A' AILERON
TYPE 'B' AILERON
1/8 SHEET 2 EA.
W1
W2
W3
W4
W5
STABILATOR PIVOT BOX ASSEMBLY DETAILS
CUT OUT SIDES, SPACERS & PLATES. MODIFY BELLCRANK-03 BELOW.
CEMENT SPACERS BETWEEN SIDES TO MAKE BOX.
EPOXY 4 PIN BEARING PLATES ON. DRILL PRECISE .250 DIA. HOLE, VERTICAL TO BOX SIDES, THRU UNIT
REMOVE, ADD 3/16" NYLON SIDE PLATES.
BEARING PLATE
.020 PLASTIC 2 REQ'D
TRAVEL
2 SIDES 1/16" SHEET
3/16" NYLON
-05 PIN
-03
.250 D
.156 DIA.
PIN-05
SPACERS
-05
1/8" BALSA SHEET
MOCK UP THE UNIT. DRILL .046 D. FOR PINS THRU BELLCRANK AND ALUM. TUBES. REMOVE BELLCRANK & TUBES. (INSTALL AFTER POD IS BUILT.) CEMENT BOX ASSY INTO FIN FRAME. (SHT. 1)
BUILT UP STRUCTURE
DESIGNED FOR 1/32" SHEET BALSA SKIN.
FOAM CONSTRUCTION
1/32" SHEET BALSA COVERING. USE END RIBS W1 AND W8 AS PATTERNS FOR SHAPING WING. GLUE 1/8" SHEET TIP RIBS-W8-ON. ATTACH LEADING EDGE & AILERON SPAR.
AILERON STRUCTURE - OPTIONAL.
A. FOAM TYPE
B. BUILT UP
C. SOLID SHEET
07 BALL LINKS B-BOLT ON, T-THEADED, R-RIVET, DU-BRO.
06 TAPE, 1/8 INCH CHROME METALLIC; PARATONE, ZIP-A-LINE.
05 KEYING PIN USE .044 DIA STOCK, SIG PINS 2 LG.
04 WOOD SCREW NO 0X3 "B" LG., PERFECT #101.
03 BELLCRANK 30° VARIABLE, WILLIAMS BROS.
02 FUEL TANK R-2 2 OZ., SULLIVAN.
01 ENGINE MOUNT KM-01, KRAFT HAYES.
ITEM DESCRIPTION SPECS AND SOURCE
"ALL-FLYING" STABILATORS SLIDE ONTO ALUM. TUBES. SECURE WITH SCREWS SHOWN. CHECK FOR CLEARANCE WITH ENGINE POD AND FREE OPERATION.
PIVOT TUBE UNIT
S1 AND S5 - 3/32" SH.
S-2,3,4 - 1/16" SH.
HALL TURBOLINER
CLIPPER AMERICANUS
DESIGN & DRAWING BY: ARTHUR I. HALL 9-75
MODEL BUILDER magazine
Plan No: 1275-B
SHEET 2 OF 2



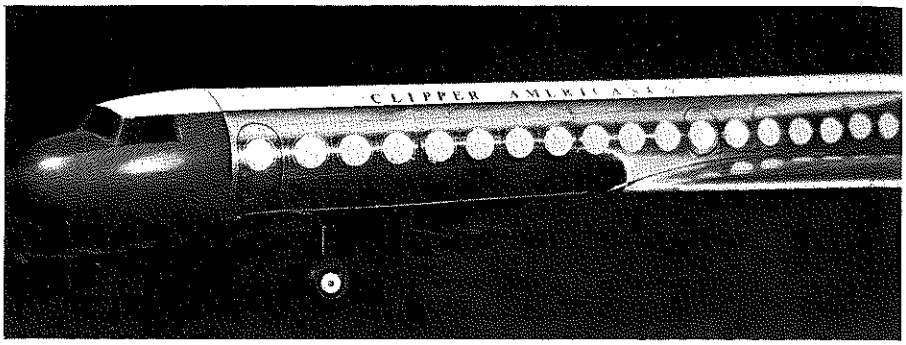
"Jet pods" house engine cylinder and muffler. Props last a long time!



A boarding passenger's-eye view of the "Clipper" accentuates its realistic lines. Article on next two pages explains the use of metal-foil covering.



Art Hall hoists the "Clipper Americanus", giving an idea of its relative size.



Close-up view of the Clipper's fuselage discloses the riveting pattern. Fuselage is sheet balsa, wet-formed over P.V.C. pipe. Radio hatch on bottom, in front of wing.

channel gear . . . in this case, the Cannon radio. Nosewheel steering was coupled to aileron. With a generous 420 sq. inch wing, a relatively low power .099 engine, and a gross weight of only 3-1/2 to 4 pounds, the design philosophy and objectives of a realistic, manageable trainer were achieved. The stabilator proved to be surprisingly non-sensitive; and pitch control is smooth and positive. Others can develop larger, higher powered versions with full house radio and retracts, which would be interesting, however, this machine is designed just for R/C transition training and sport flying. If I can fly it, anyone should be able to!

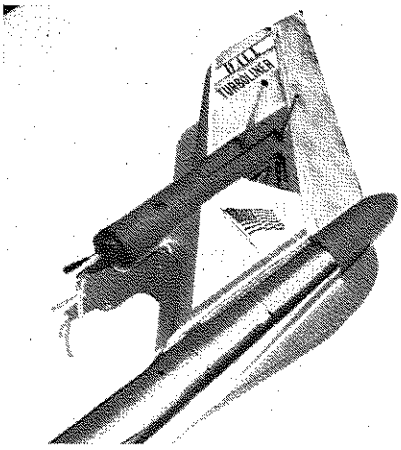
CONSTRUCTION: The full size plans should be self-explanatory for the routine construction details. I show my recommended construction, but "builders' choice" and "modifications" prevail. So these instructions are limited to overall explanations and specific or unique aspects of construction.

FUSELAGE: The basic structure is a sheet balsa box crutch forward, and an "X" crutch aft, the whole covered with a sheet balsa shell. I formed the shell by wrapping water-soaked balsa sheets around a 3-1/2 inch O.D. PVC pipe, covered with newspaper to help absorb the moisture for drying. Use one of these pre-curved sheets as a fixture to cradle the two crutches (top side down) for alignment and joining. Attach all bulkheads and the curved side sheets. Build up the nose wheel shaft unit before covering the forward fuselage top. Leave the shell off the top and bottom of the aft section and work on the fin assembly.

VERTICAL FIN ASSEMBLY: Build the basic fin structure on the "X" crutch noting that F-1, F-2 and F-3 all go through the crutch to the bottom shell and tie into the sub-rudder (SR). Do not cover the fin until one of the last steps, since there must be access to the pivot box to mount the bellcrank and aluminum tubes.

Build up the stabilator pivot box. Use a drill press to accurately drill the bearing hole in the side plastic plates for the front pivot tube. Mock-up the 30° variable bellcrank to the two tubes and drill the holes for the retaining pins. Remove the tubes and bellcrank and mount the pivot box into the fin's frame.

POWER POD: Make the pod shell from two plys of soaked 1/32 balsa sheet, rolled into a tube the diameter of former E-2. Position and cement E-2 in place. Cut out firewall E-1. Flatten the rear of the shell as if to fit against F-3, and the front end will assume the oval shape of E-1 which can then be positioned and temporarily pinned into place, slot the top and bottom of the shell to slide onto the fin structure.



Pod and fin construction is strong and rigid. Bottle tank is directly behind engine.

Cement in place, with E-2 against F-1, and the aft end flattened against F-3 on each side. Locate and drill the pivot tube hole and travel slot each side. Make and attach fillets. Build up the bottle tank onto the firewall and attach the engine mount. Epoxy the firewall assembly into the pod.

FINAL FUSELAGE ASSEMBLY: Now, before covering the aft fuselage or fin, would be a good time to mock up your servo installations and run your Gold-N-Rod through the aft fuselage for elevator, throttle and rudder (if used). The fuselage may now be completed and covered. If rudder control is desired, build and attach it. If fixed rudder is used, build it onto F-3. Slip the bellcrank inside the pivot box and run the aluminum tubes into position; pin and

Continued on page 84

as the throttle was advanced. Directional control was a little too sensitive, so we moved the servo link a little closer to the center of the arm. This helped a lot, and even though the wind conditions were gusty, the little chopper exhibited excellent control. Remember too, that without the body, there are no tail-feathers out on the boom to help stabilize it.

After a couple of tanks of fuel in this mode of operation, we took our alloted 5 minutes to install the Hughes 500 body and flew it again. It was necessary to add a couple of ounces of lead weight in the nose to counterbalance the added weight of the tail boom. Again, the response was terrific, and she flew with all the grace of the larger helicopters. I think my first reactions to the plastic body were from pre-conceived ideas resulting from other unsatisfactory experiences, but I certainly am pleased with the Scorpion and Hughes shells on this kit, and expect a long life-span due to the fine materials used and design techniques involved.

FINAL APPROACH

This Tri-Star just has to be a winner in anybody's game . . . she's beautiful, inexpensive, right size, and flies very well for the experienced chopper pilot. I would, however, hesitate to recommend it as a beginner's machine for two reasons . . .

First, the instructions and drawings supplied with the kit are inadequate, unless you've had previous experience in constructing helicopters (the photographs with this article should help considerably in "visualizing" the missing drawings.)

Second, the directional stability leaves a lot to be desired, since the tail rotor control is so very sensitive! Adjusting the tail rotor linkages to absolute minimum throw did help a bit, but I'm not too sure it's the final answer . . . perhaps the Kavan gyro will tame it enough for the beginner . . . or an added vertical fin might help.

Anyway, this next weekend I'll put her through her paces, though I'm already convinced she'll prove to be a very active machine for the money. BCNU next month. •

Americanus . . . *Continued from page 10*

epoxy them. Now cover the fin sides with 1/32 sheet.

WING AND STABILATORS: Both foam and built-up structures are shown. Recommend either be covered with 1/32 balsa sheet, particularly if the metal-foil covering is used. Note the use of sheet plastic root ribs and screw retainer plates on the stabilator. I used .018 poly-carbonate sheet which is a very tough plastic!

ENGINE COWLING: The mounted engine was wrapped in paper towels with no undercuts, plaster applied, and then shaped for a male mold of the lower cowl. This was used to make a fiberglass cowl. The balsa jet nacelles were then fitted to this and faired with cloth and glass. Pull this off the engine and shape the inside, reinforcing with fiberglass where necessary. (An alternate method of making the cowling is to build up and shape from balsa blocks). The tailpipes are 1/32 sheet tubes, attached with 2-56 screws to the nacelles.

Nose and tail were shaped from urethane foam and lightly glassed. Hollow out the tail cone for weight savings. Ambitious builders may build up a hollow nose section with detailed interior and clear plastic windows. Or, leave it solid and use Monokote black windows. The cabin windows are also patches of black Monokote (sticky-back trim).

RADIO INSTALLATION: Mock-up your particular radio equipment to locate the C.G. near that shown on the plan. Better more forward than aft! (Put the battery in the nose if need be). Installation of the 3 channel Cannon is shown, giving elevator, throttle and aileron, with coupled nose wheel from the aileron servo. If rudder is used, couple nosewheel to it as usual.

CONCLUSION: I preferred shock mounting the wing with rubber bands. Most all other components are attached

with screws. The finishing technique is at builder's option, but I used rivet-detailed metal foil covering. *(See separate article in this issue by the same author. wcn)*

This miniature Jetliner takes more time to build than the typical square "ugly" something, but the results usually speak for themselves. With your own ideas, imagination and efforts, you can be a part of the jet age with your own "Clipper Americanus." •

F/F Scale .... *Continued from page 41*

will argue that R/C scale is the toughest one. After all, look at the amount of time and bucks that go into the good AMA scale R/C model. I agree, but with good, sound, reliable radios that are commonplace today, and a proficient pilot at the transmitter, the chances for flight and survival are excellent.

There is nothing more that can weaken the heart and send one's pulse rate sky high, than to start your model's engine in preparation for the first flight. In many cases, years of work is on the line on that first launch. A need for tall grass is evident . . . but once the model has been trimmed to fly the way you want it to . . . there is nothing more gratifying.

The question in my mind is, why does there appear to be a lack of interest in gas scale? Even on the Nationals level, there are seldom more than 30 gas powered scale models, and that's including Juniors through Open members. That doesn't come close to averaging one model per state. Now that rubber scale has experienced a renaissance, what can be done to get the same kind of action for F/F gas scale? Why can't there be some kind of international competition for both rubber and gas scale?

With only 6 AMA scale entries this year at the Nats, three of these six entrants will be representing the United States in international competition. Wouldn't it be nice to have a F/F scale team chosen from fifty or sixty competitors and going along as well? Maybe this is what it will take to put gas scale into the swing of things, and I for one, will see what can be done. How about you? •

Found ..... *Continued from page 33*

attempts are successful. I believe that the rubber I was using is not quite as powerful as Pirelli, or the newer black Sig contest rubber.

Dead calm glassy conditions are fine for test flying, but they are a little harder to R.O.W., because the surface tension is harder to break. Have a friend throw a pebble in the water just before you attempt the R.O.W.

The best conditions for R.O.W. flying include a very light breeze to lightly ripple the water, and a drift that will bring the model back to you if it lands in the water. The breeze also shortens the takeoff run and gets the model on step quicker.

It is not always easy to observe everything that occurs during a takeoff attempt. If the propeller throws a lot of spray, either add spray dams, lengthen the spray dams that you have, or shorten the propeller a little. Water thrown back on the model is another source of drag and excess weight during the takeoff.

If the model dunks itself several times, give it a chance to dry out. The extra weight of a water-logged model is unfair to the poor little thing.

Go out and have fun with your Found. It's the best excuse a person ever had to go wading along a muddy shore. •

Counter ..... *Continued from page 7*

fornia 91331, comes with 96 precut parts which are machine cut and hand finished from the finest balsa. The kit comes complete with all hardware, but the necessary sheet and strip stock is not supplied. This holds the price of the kit down to a very reasonable $25.00. The three large plan sheets are beautifully printed in blue-line, and together with the step-by-step instruction booklet, makes assembly of the kit very clear and straight forward. This semi-kit puts the latest design trends, incorporated into a quality kit, well within the reach of the average modeler. The Satellite 788 GLH is available direct from Satellite City. Californians remember to include an extra 6% "mad money" . . . Oh . . . be sure to stick it together with Satellite City's "Hot Stuff!"

* * *

Swank Products, 729 West 16th St., Costa Mesa, CA. 92627, is producing an electric powered R/C gunboat, 45 inches LOA. The boat comes completely finished with or without radio, and being designed primarily for action, it is semi-scale as delivered. And the action isn't just "Go, stop, back up, and steer."

The bow-mounted gun fires a pump-operated stream of water better than 20 feet, and in a sea battle with another