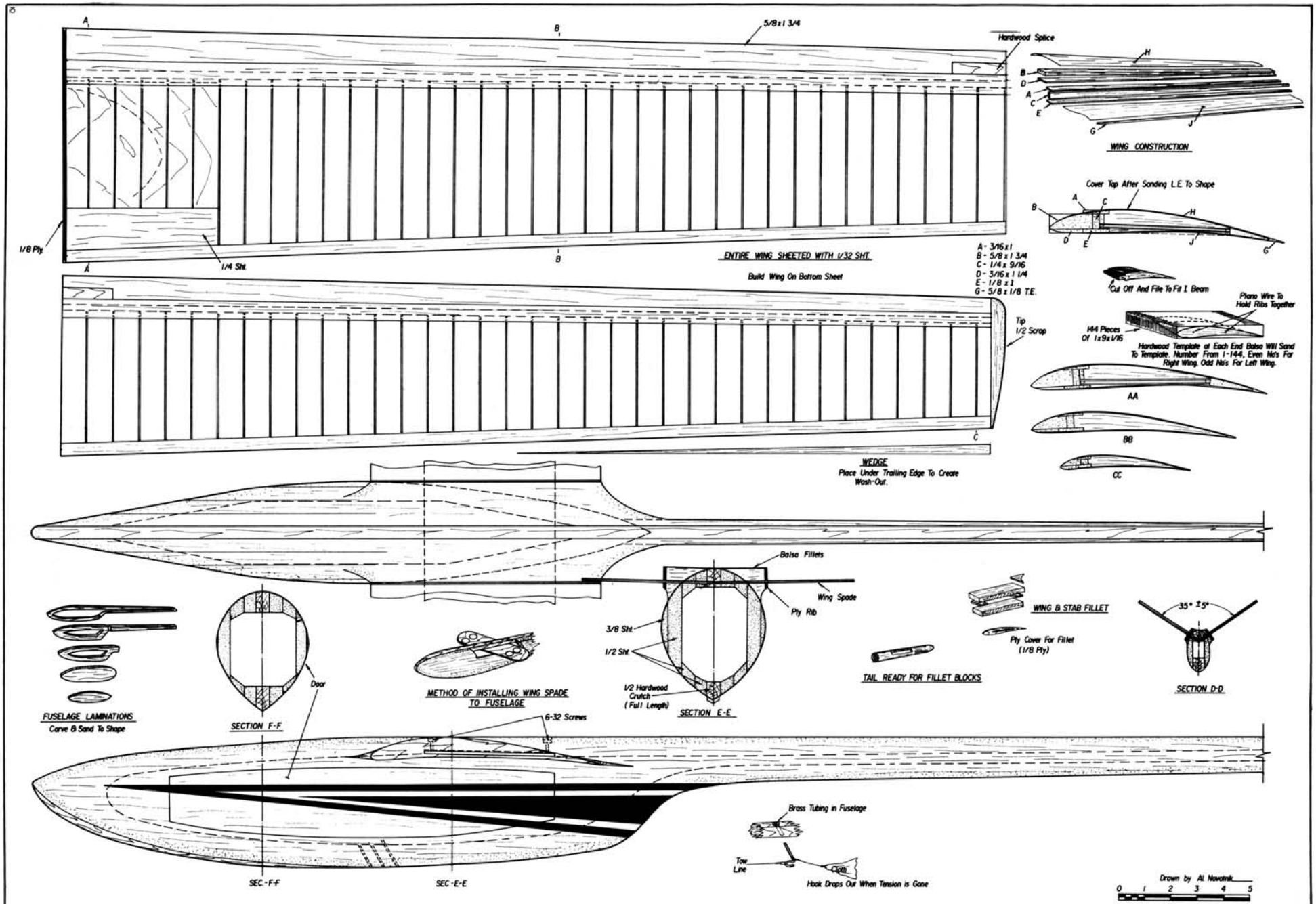
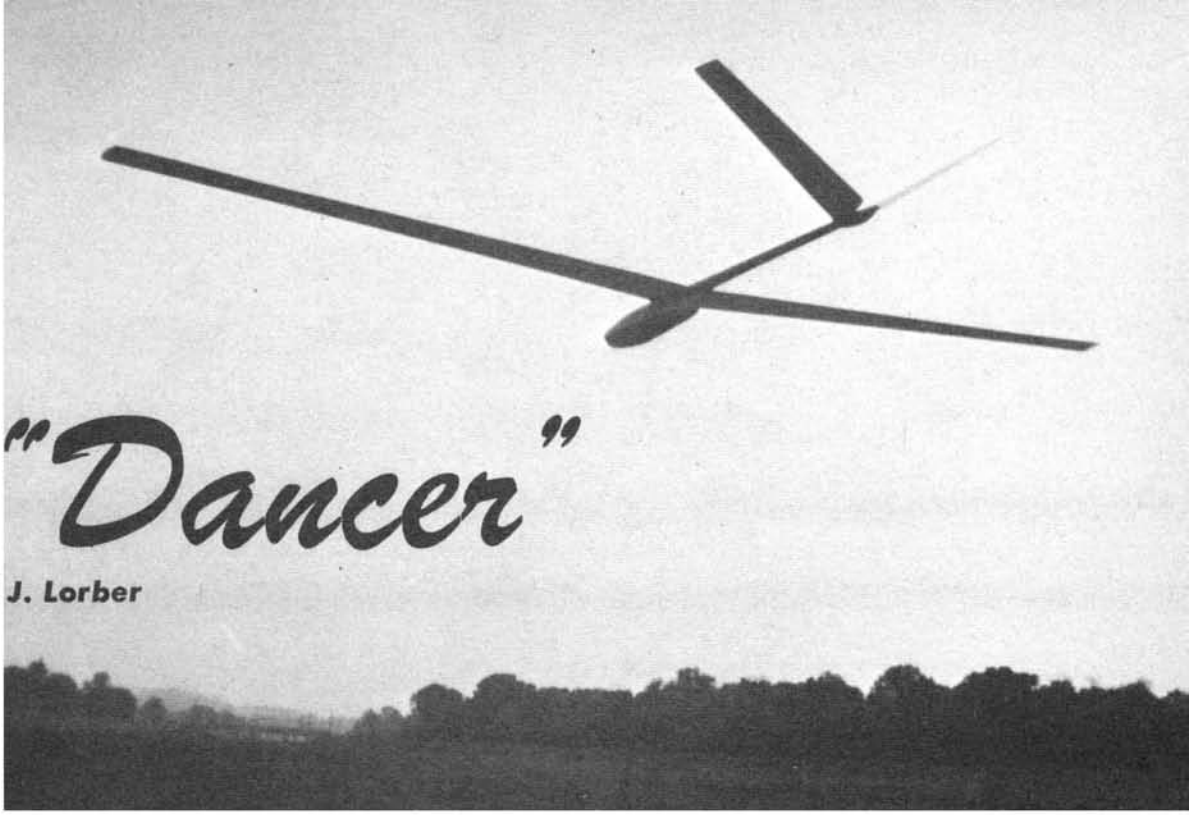

A
B
5/8 x 1 3/4
Hardwood Splice
1/8 Ply
1/4 Sht.
ENTIRE WING SHEETED WITH 1/32 SHT.
Build Wing On Bottom Sheet
A - 3/16 x 1
B - 5/8 x 1 3/4
C - 1/4 x 9/16
D - 3/16 x 1 1/4
E - 1/8 x 1
G - 5/8 x 1/8 T.E.
Tip 1/2 Scrap
WEDGE
Place Under Trailing Edge To Create Wash-Out.
WING CONSTRUCTION
Cover Top After Sanding L.E. To Shape
Cut Off And File To Fit I Beam
Piano Wire To Hold Ribs Together
144 Pieces Of 1x9x1/16
Hardwood Template at Each End Balsa Will Sand To Template. Number From 1-144, Even No's For Right Wing. Odd No's For Left Wing.
AA
BB
CC
Balsa Fillets
Wing Spade
Ply Rib
3/8 Sht.
1/2 Sht.
1/2 Hardwood Crutch (Full Length)
SECTION E-E
WING & STAB FILLET
Ply Cover For Fillet (1/8 Ply)
TAIL READY FOR FILLET BLOCKS
35° ± 5°
SECTION D-D
FUSELAGE LAMINATIONS
Carve & Sand To Shape
SECTION F-F
Door
METHOD OF INSTALLING WING SPADE TO FUSELAGE
6-32 Screws
SEC-F-F
SEC-E-E
Brass Tubing in Fuselage
Tow Line
Cloth
Hook Drops Out When Tension is Gone
Drawn by Al Nowatnik
0 1 2 3 4 5



The "Dancer"

by Carl J. Lorber

Carl's "POD & BOOMER"... twelve foot graceful radio soarer:

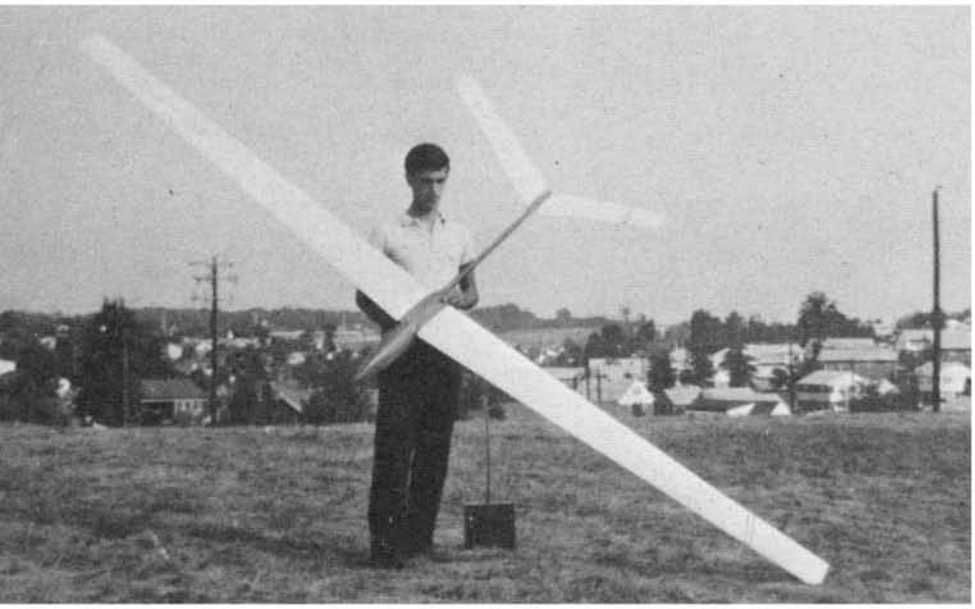
Enough ribs anyway. Every inch! Cut 'em out in one stack operation, and you end with a wing that holds true airfoil, no sag, no sorrow. 1/32" sheet covers all, makes a warp-resistant skin-stressed wing.

A sight to see in the air. These big birds really hover, sniff out the slightest rising air. The kind of ship that's worth building.

The pod and boom fuselage assembles easily, slender, minimum drag.

FULL SIZE PLAN AVAILABLE THROUGH "MODEL PLAN SERVICE."

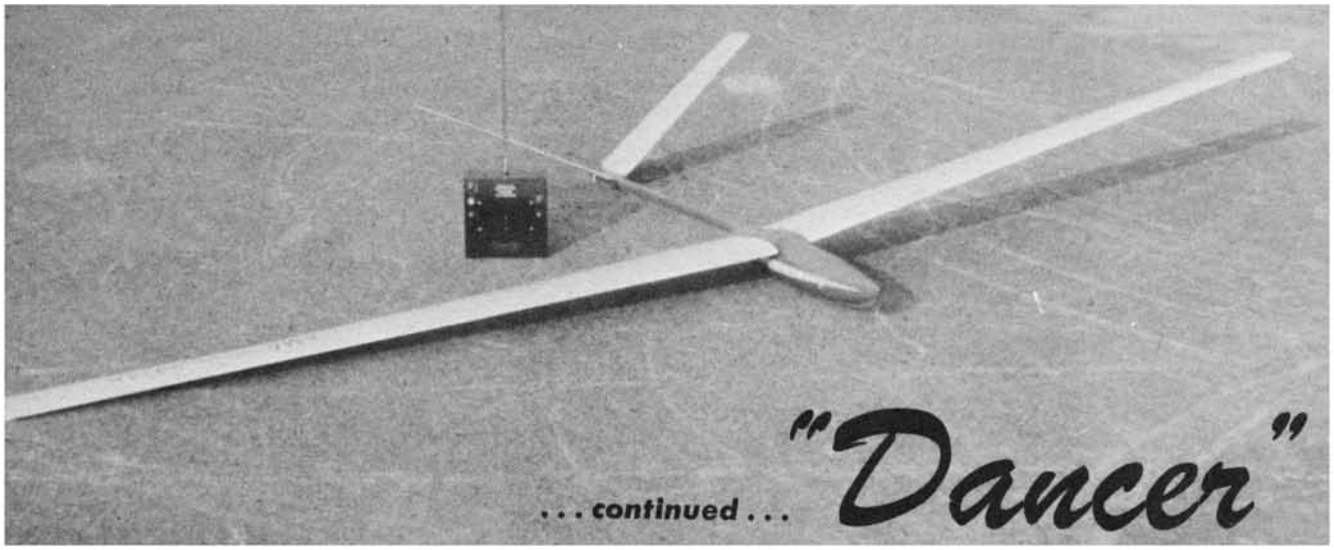
Citizen-Ship Radio, unique servo mount servo's the servo.



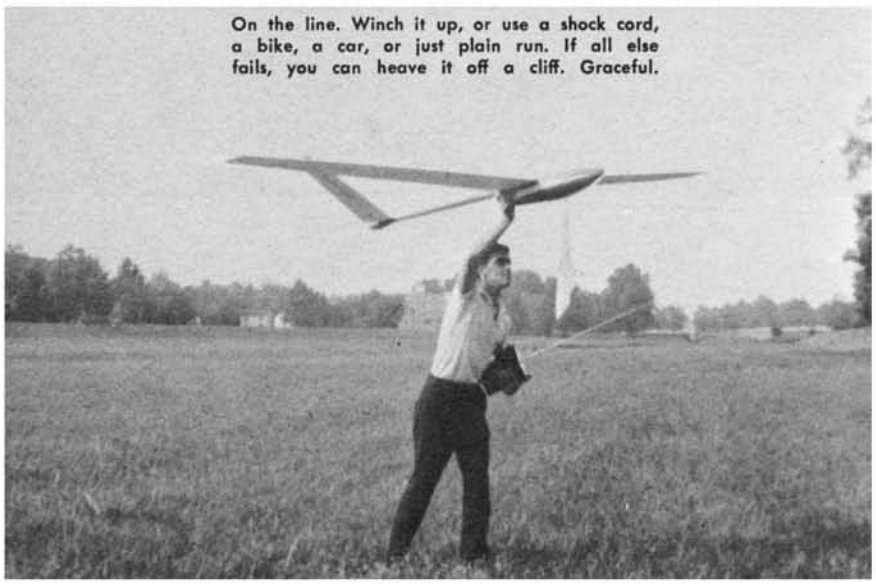
♦ The "Dancer" (Carl's "Pod & Boomer") is designed for the "purist", the modeler who really loves soaring. It is not compromised in size for what it should be, but is rather designed as a true soarer with a thin high-aspect ratio wing to sense the rising air, the minimum of frontal area, skin friction and resulting drag, and ample area to carry the necessary radio guidance payload. It is a high performance aircraft in every sense of the word, which demands a reasonably experienced hand in building, and in flying. While a glider is the easiest of aircraft to trim in flight, it does require past experience on the towline, as a mistake here could easily wash a wing out.

There are smaller and easier soarers to build. From three feet up, but as the saying goes, "you get what you pay for." The smaller aircraft are overly burdened with the weight of radio, and are simply incapable of the glide ratios of these big aircraft. If your interest in soaring is casual, something in between can be found to suit your efforts. For the more dedicated glider enthusiasts who dream of the ultimate in soaring performance, we think you'll find the "Dancer" a worthy step in the right direction. Locally the ship is known as Carl's "Pod & Boomer", but as it whirls majestically overhead in the thermal currents, "Dancer" seems appropriate.

A full size set of plans may be ordered if desired, to give you a running start. Consider only the best grades of wood for an aircraft of this type, due to the slender form of the wing panels. These are naturally more prone to warp than stubbier panels, but a glider is a glider, and you must live with high aspect ratios. For those of you inexperienced with "V" (butterfly) tail designs, fear not. They respond



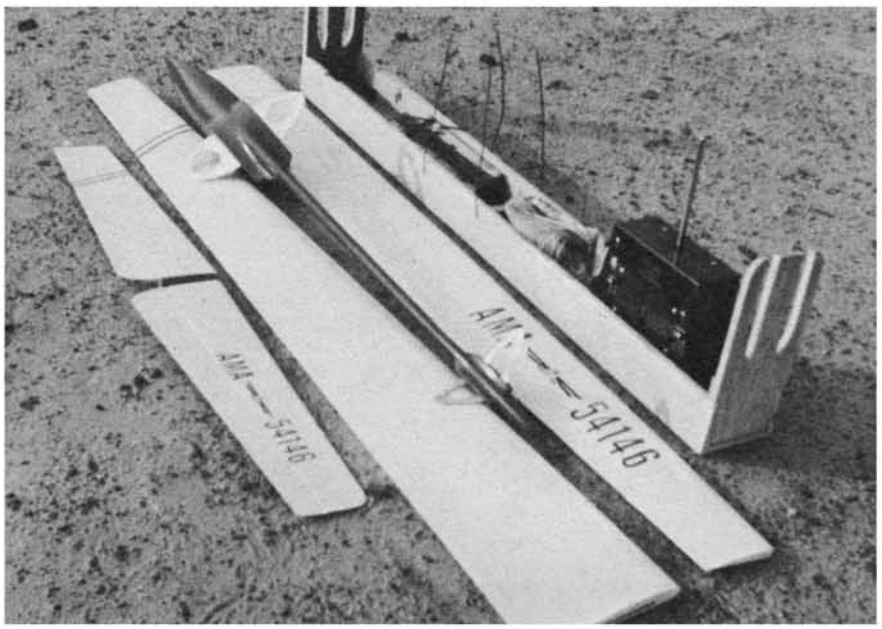
...continued... "Dancer"



On the line. Winch it up, or use a shock cord, a bike, a car, or just plain run. If all else fails, you can heave it off a cliff. Graceful.

A servo slides a servo, and thus you have up-down, left-right in any combination. A nice system for a glider, but think it out further before installing in a competition stunter. G-forces of the servo's weight could become troublesome. No problem in this design however.

The "V" or butterfly tail has side advantages. Not so prone to catch a tip and break the boom. Stable, forgiving, unusual, easy, pretty.



beautifully, are easy to trim, and are commonplace on full size soarers, powered aircraft such as the "Bonanza", and have proven themselves on all types of model aircraft.

As for launching a big soarer of this type, towlines are in order. Up to 965 foot lines are currently being used, with a powered winch or a rubber shock cord pulling the model aloft. The model may be corrected via radio commands while rising on the tow, a fact that makes radio soaring more practical than towliners of old. It is easily possible to rig an auxiliary power pod for a small engined assist, though it is a shame to compromise your efforts. Still, some terrain is less suitable and almost demands a power assist. Cliffs and hillsides also offer wonderful possibilities. Winds should be striking the slope, as the leeward hillside will offer turbulance and strong downdrafts. Try the ship in milder air in the beginning, until you learn the aircraft's capabilities and wind limitations.

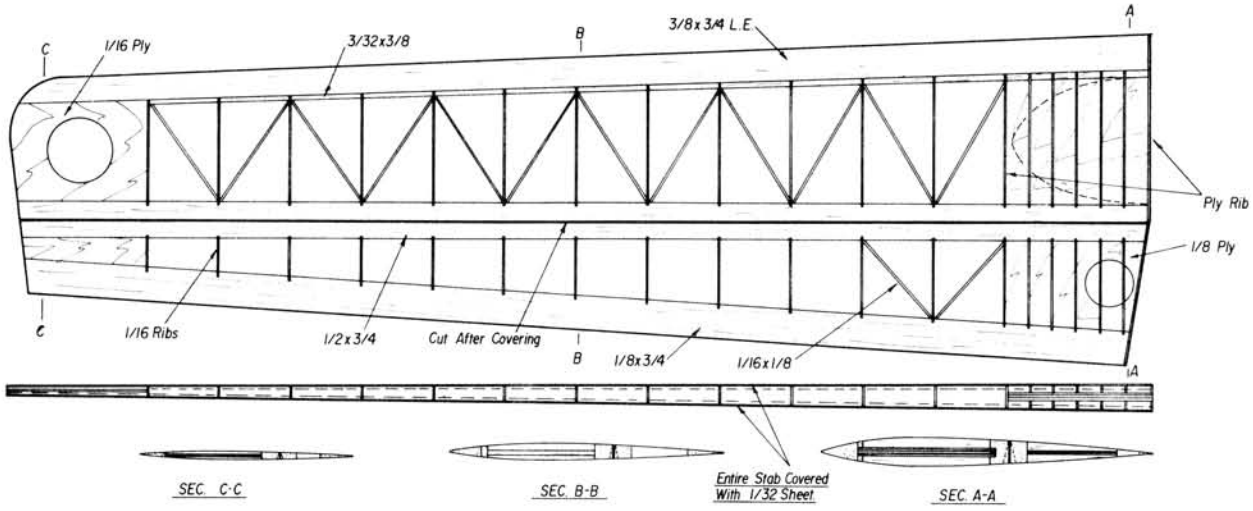
As for the radio guidance system, the original is using a 10 channel Reed Citizen-Ship Radio, presently on loan from a friend, in conjunction with a twin servo control system that can give up and down control, right and left control simultaneously, for the "V" tail design. This servo package will allow any reed or any one or two stick Digital Transmitter of two channels or more to control the "V" tail, as it would a normal rudder and elevator ship.

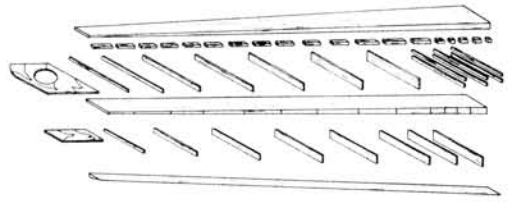
As this aircraft is hardly a project for the novice, we will cover only the structural points of interest. The plans are self explanatory for the most part, and a little study of them will clarify the building technique in your mind.

I found a 1/8" x 3/4" x 72" aluminum strip, purchased at the hardware store, a wonderful tool for drawing, cutting and aligning on this model. Cost was

(Continued on Page 45)

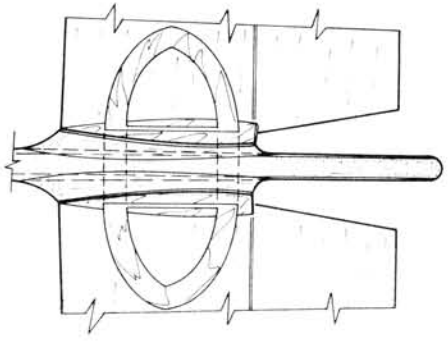
Panels detached, slip onto metal tongues for a practical sized aircraft to travel. Notice the elongated field box which carries it all. Nice.

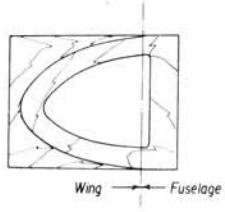




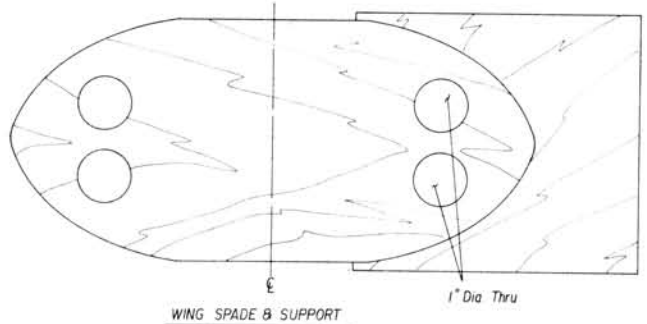
STAB CONSTRUCTION

METHOD OF ASSEMBLING WING SUPPORT

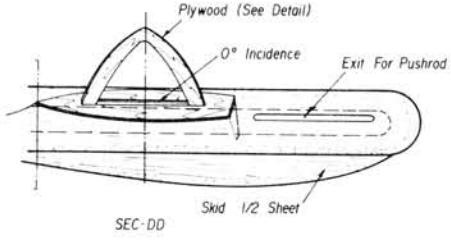




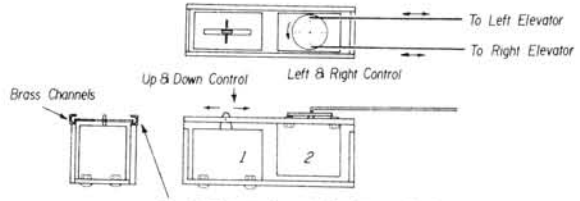
ELEVATOR SPADE & SUPPORT
1/16 Ply 2 Reqd



WING SPADE & SUPPORT
1/8 Ply 1 Reqd



SEC-DD



The Top Slides in Channels, The Number Two Servo is Mounted To The Top Side Thus It Is Moved Forward & Backward By Servo No. One. Servo Number Two While Sliding Forward & Backward Is Capable Of Turning Left or Right. Up & Down Transmitter Stick Controls Number One Servo While Left & Right Stick Controls Left & Right Control.

THE "DANCER"

(Continued from Page 12)

$2.00, and well worth it, something of value for other aircraft to follow as well.

The wing support is also of aluminum alloy, and a strong piece with little aluminum in it should be chosen, because the force a seven pound aircraft can exert on it can be unbelievable. I had to rip mine out to replace it with something stronger. The stab offered less of a problem, and 1/16" stock seems to work well. The aluminum skid on the nose has stood up well for many runway landings, plus an accidental encounter with a concrete block out in the grass. There must be some sort of magnetism that draws model aircraft toward trees, rocks and immovable objects.

The Stabilizer: This is made of contest weight balsa throughout, and covered with pre-sanded 1/32" sheeting. All spars must be tapered before installation. The ribs can be cut before installing, however I inserted them, then trimmed and sanded them to airfoil. I consider the 1/32" sheet covering a necessity to prevent flutter and twisting of the surfaces in turbulent air, or at the high speeds encountered in returning from thermals and during towing. I tested this stabilizer, installed on the fuselage, with a car, to a speed of 50 mph, I feel confident it will stay true at any altitude or speed this type model is likely to encounter.

Wing Structure: Hard balsa or pine "I" beam is the heart of the wing's strength. As on the stab, the wing also is entirely sheathed in 1/32" sheeting, to produce a nearly twist-free wing design. I covered these panels with silk (optional), and found them to be very strong, smash resistant and totalling 1 lb. 8 ounces each.

The sheet covering on the wing should be glued together at the trailing edge, with a strip then added to the trailing edge. This produces a straight trailing edge that will stay that way. Ribs are of 1/16" sheet balsa, spaced every inch, so I'm sure you will find them enough to keep the airfoil. Actually, they are easily cut out in one operation, as detailed on the plans. Make one big stack, and taper the ribs from template to template, utilizing a straight edge for checking purposes. The large number of thin ribs is to your advantage in a stack operation such as this, as each rib ends up only slightly bevelled on the edges. The first two ribs are #1, the second two, #2, the third pair #3 etc. By alternating the pairs of ribs to the left wing and the right panel, the bevelled effect will cancel out nicely. If the second of each pair of ribs were selected for the left panel for instance, every rib in this panel would end up a tiny fraction smaller than the right wing. By realizing this, and carefully alternating these second ribs, both panels will be more uniform.

The 1/8" ply in the tongue support must be epoxied. Do not consider other cements. Also note there is 3/8" of washout at the trailing edge of each tip, tapering down to 0" in 18" distance. The washout (trailing edge raised at the tip) combats the possibility of tip stall, and is important to the performance of the glider.

The Fuselage: Basically it is of hard balsa or a pine core, covered with very soft balsa. Fillets are formed of Hobbypoxy "Stuff", capped with ply. 1/8" dia. tubing in the fuselage mounts the tow hook, which seeks position with the towline attached or removed. A nylon control guide is employed in the tail section where the piano wire exits the fuselage to attach to the elevator.

Servo Package: This type "V" tail arrangement requires the use of two servos, one with opposing push-pull control, as you would set up aileron movement. This single servo is mounted on a sliding tray that is moved forward and backward by a second servo to produce up and down control of both elevators at the same time. Meanwhile, this allows the push-pull servo to work freely and independently at all times regardless of the degree of up-down control. The servo tray is made of plexiglass, epoxied together and drilled with holes to lighten. It can be made to hold the receiver also.

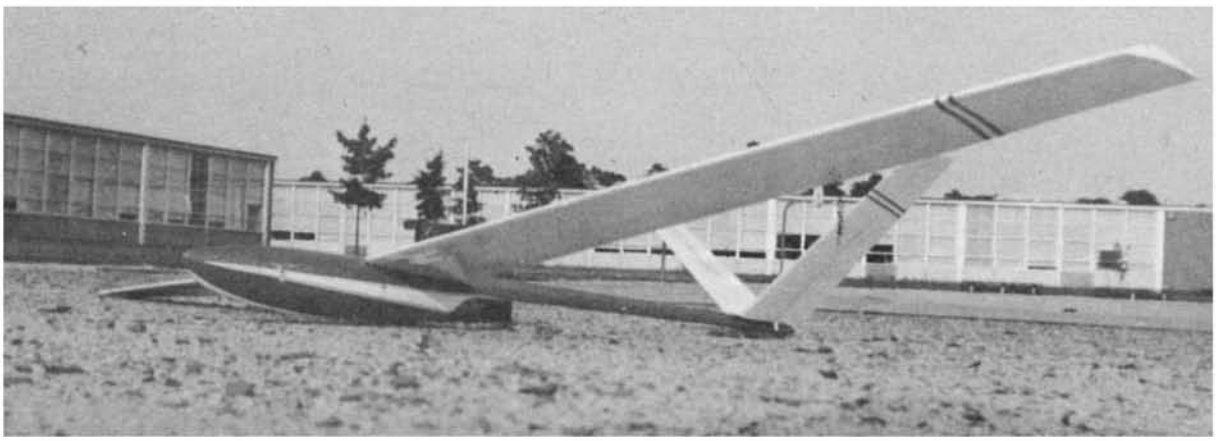
Odds and Ends: Nylon control horns were used, however they stand out like a sore thumb on an otherwise clean design. Try to find ways to cut down such parasitical drag, as it returns nothing in the way of performance. The tow-hook retracts nicely, and the aerial on the original lies buried under the Monokote covering, along the leading edge of the wing. I think the system as used on the "Kurwi" would be excellent.

Tip and root rib templates should be cut with great care and precision from 1/16" plywood. Spend the time required to accurately stack and trim the ribs properly. The technique is sound and worth knowing for future aircraft.

Sanding the airfoil on the stab is a little tricky, as the ribs have a tendency to sand away to nothing right where you want the airfoil thickest, so be careful. The finished stab is worthy of your best workmanship. Oddly, people at the field seem compelled to stoop and touch the stab, for reasons I cannot explain.

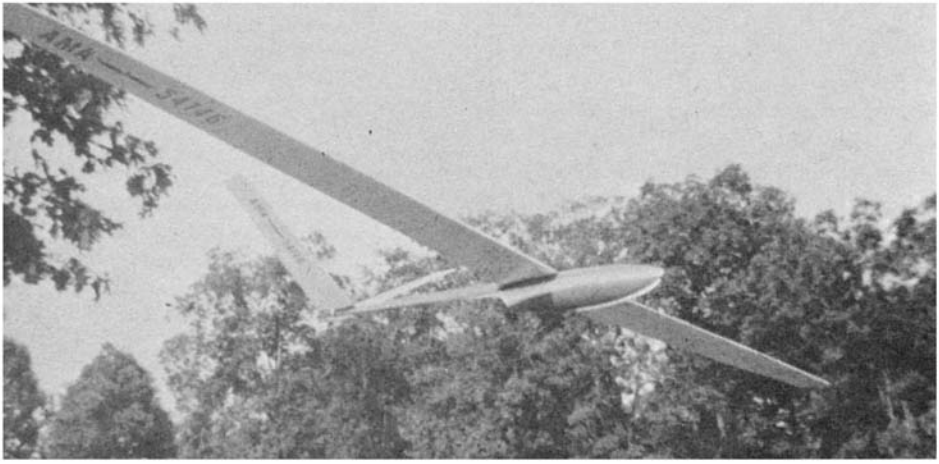
As for hinges, I strongly recommend a full length hinge. I used a "V" slot (see figure #1) closed at the top with a MonoKote hinge, but when the stabilizer was converted to a "V" tail, the underside was visible. Perhaps the checkered cloth system of old would look better, as in figure #2.

Flying: High aspect ratio wings and strong winds do not mix, so save yourself some grief, and consider the aircraft for calm to moderate breezes only. A glider is easy to check out safely in initial hand launches, and then from a gentle hill. Shim it here or there as performance dictates, and proceed to inital tow trials. Keep it true into the wind, correcting as it climbs away. Strive for a gentle release, and let the model fly itself as much as possible. Every unnecessary command is that much more drag to kill your glide, so use finesse rather than nervous fingers. Watch your wings tremble and dip as it hits into a rising thermal. See you later. . . . ●



THE "DANCER" SOARER

12 feet of soaring grace, a pod and boom giant, for towline and winch, for slopes and cliffs.



FLYING MODELS