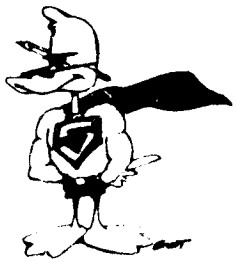

In the interest of furthering builder input, and because I had earlier promised to submit some ideas, I have enclosed some information and drawings which might be of interest to those builders in the early stages of construction. My Osprey project started in July, 1981 after about 3 years of helping another builder get his project started. It has been about 6 months now since I have done anything with my bird because of other demands, but with winter coming on, it will take up all my spare time until spring.

Since I'm working alone, and building from scratch, I probably spent as much time building jigs as I did in actual construction. One of my ideas that helped me tremendously is that I constructed the entire fuselage including the gunnel rails, floors and keel, water drain, and all gussets without once removing the fuselage from the framing jigs. This was accomplished by constructing the fuselage upside-down in the jig. As strange as this might seem at first, the result was a much stronger fuselage without the use of any support braces across the cabin area when the fuselage is finally removed. This procedure alows the gunnel rails to lie perfectly flat in the jig, and by mortising the inner gunnel rail into the nose former, there was no tendency for the rail to twist inward as I had seen on other projects. Additionally, there is no movement of the fuselage before the floors and keel are attached, eliminating the need to jig and brace the fuselage twice to apply floors, as my plans called for. I also used a carbide saw blade with welded tips which were just thousands of an inch narrower than the 1/8" kerf needed for the keel batten, and a simple clamp/jig was used to attach the batten without any pre-bending. (see drawing #1).

With the fuselage removed from the construction frames and the aft deck attached, I built another jig to position and hold the fin spars for glueing. (see drawing #2).

When I constructed the fuselage side frames, I pre-beveled the uprights which saved enormous amounts of work and frustration. I found also that by adjusting the upright at Sta. 102 to maintain 27" between it and Sta. 70, when the fuselage sides were bent, the main and rear spars installed, I had exactly 26 7/8" between the spars and no shims were required for the rear spar. This is the correct distance for the wing ribs. DO NOT change Sta. 70 to accomplish this.

I also found that had I followed the cabin width dimensions called for in my plans, my particular fuselage sides would not have had a smooth curve from the nose to the tail. I opted to adjust my fuselage jig accordingly to allow such a smooth curve and gained 1" in cabin width which is not enough to interfere with gear retration.

I also had a problem setting my stabilizer correctly using the dimensions in my set of plans. In order to correctly set the stabilizer, I had to use a larger mount block and longer attaching bolt, and the rudder/hinge stab. mount fixture had to be rebuilt, but this was necessary to obtain the +2 deg. edge spar. Additionally, after constructing the entire tail group and installing same,

everything looked great, but I had no rudder deflection with the elevator in the up-atop position. I checked specs and re-checked specs over and over, and looked at other sets of plans, both earlier and later than mine, and finally called George who advised me to relieve and radius the elevator spar 1/4" more rudder travel. I finally rebuilt the entire elevator spar, reinforcing the area in question, and built around the problem, with the result of maximum deflection of rudder in all elevator positions, and a stronger elevator spar.

I wasn't pleased with the water rudder cable passing through the fin spar and rudder spar without some protection, so I used a hollow brass rivet installed in the rear fin spar to allow the cable to pass through without undue wear on the plywood. I also re-designed the area around the water rudder in the rudder to allow the water rudder to be removed without destroying the air rudder. Rather than include any drawings, I mention this as possibly a solution should the water rudder require any future maintenance or adjustment.

My plans call for a rectangular hole to be bored out in the rear wing spar to allow passage of the elevator push rod. I suggest that this hole not be bored until the rear spar is in position, and the bellcranks at Sta. 86 and Sta. 172 are in place temporarily, as some shifting of the bellcrank at Sta.. 86 may be required to allow smooth, non-binding movement of the elevator pushrod. I had heard of this potential problem before I bored the rear spar, or mine would not have worked without tearing out the bellcrank at Sta. 86 or making the hole in the rear wing spar dangerously larger. After the elevator pushrod was installed and working smoothly, the idler pulleys were then installed.

After receiving a ride in the prototype at Oshkosh in 1978, I knew I would have trouble with my big feet on those closely-spaced rudder pedals, so I re-designed my rudder pedals, eliminating the need to do any welding after the bushings were installed and gaining a couple of inches of spacing to boot. This was accomplished by eliminating the rudder horns completely, and welding tabs to the rudder pedals. It was also necessary to change the position of the steering horns because the retract rod would not pass by the rudder pedal assembly. In doing so, the design of the steering horns was also altered somewhat,to allow me to remove slack in the steering cables and adjust the alignment of the nose wheel. (see drawing #3) by adding or subtracting washers on the clevis bolts at "A". This setup requires 2 cables for steering instead of 1 as called for in the plans, but eliminated a lot of flexing of the steering cable. The rudder cables are routed in plastic tubing. I mounted the steering cable pulleys upside-down on the wet box and eliminated the cable keepers. (see drawing #4). I have since seen where these pulleys were eliminated altogether by other builders with good results, so it's a matter of choice. The use of heat shrink tubing over the cable ends is worth repeating as it makes for a much neater looking setup, and snagging nylons, etc. I was able to move the rudder pedal assembly forward about an inch and a half for a little more leg room.

I already had my gas tank constructed when wing tanks came about, but had not yet installed my main spars, so I spent alot of time trying to decide which was the better way to go. I finally opted for the wing tanks for safety reasons and more room in the cabin. But I'm left with

about a 37 gallon tank constructed of fiberglass matting and safetypox epoxy resin that I will probably use when I make my fiberglass three-wheeled car I'm planning to build sometime in the next 10-20 years.

I have also enclosed a drawing of the elevator trim tab I'm using. It certainly isn't any easier to construct, but for me it eliminates the bellcrank exposed and looks much neater, and works great.

I'm now into the fourth year of what I thought would be a one year project, and two more years would not be unrealistic at this point. I have used many of the suggestions and ideas presented in past newsletters, and it is comforting knowing that other people share a common dream, with common problems. I have a limited budget which requires that a lot of scrounging and make do be applied. I've ruined clothing, tools, materials, and nearly a marriage. I've been cut, burned and even lost the tip of one finger in this endeavor, but I'll be damned if I'll quit now.

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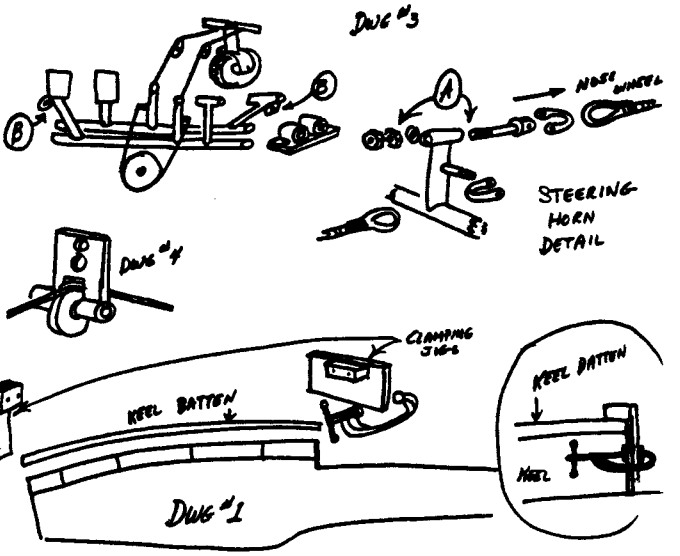
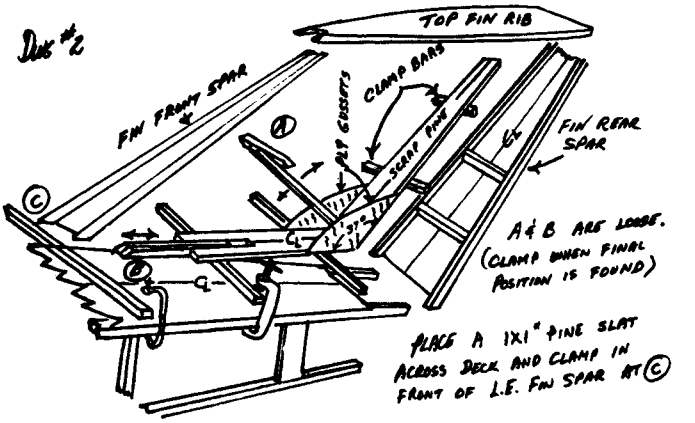
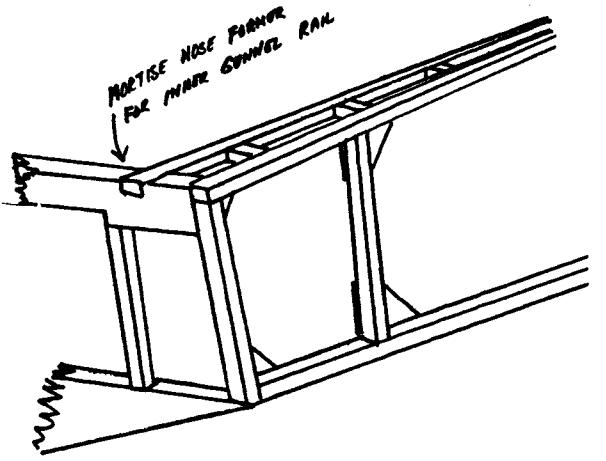

DWG #3
A
B
NOSE WHEEL
STEERING HORN DETAIL
DWG #4
CLAMPING JIG
KEEL BATTEN
KEEL
DWG #1

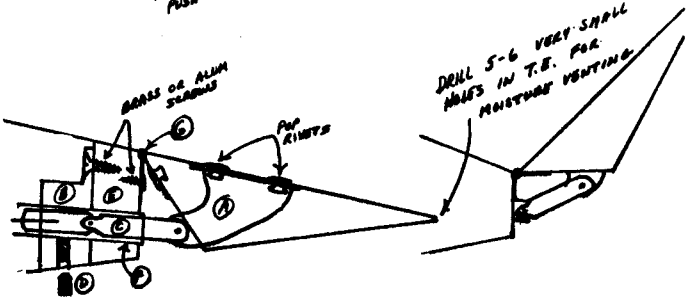

DWG #2
TOP FIN RIB
FIN FRONT SPAR
CLAMP BARS
PLY GUSSETS
SCRAP PINE
FIN REAR SPAR
A
B
C
A & B ARE LOOSE. (CLAMP WHEN FINAL POSITION IS FOUND)
PLACE A 1X1" PINE SLAT ACROSS DECK AND CLAMP IN FRONT OF L.E. FIN SPAR AT C


ADDITIONAL NOSE FORMER FOR INNER GUNNEL RAIL

ELEVATOR TRIM TAB

(LOOKS AWFULLY BUSY - BUT IT REALLY ISN'T)

I REDESIGNED TO KEEP CABLE, HINGE, AND BELL CRANK OUT OF SIGHT AND AIRSTREAM - TAB IS FOLDED AS SHOWN FROM ONE PIECE USING LIGHT CARDBOARD AS A PATTERN FIRST, SINCE IT'S QUITE SOLID THIS WAY - LIGHTER GUAGE ALUMINUM CAN BE USED.



A - BELLCRANK "POP" RIVETED TO UNDERSIDE OF TRIM TAB W/FLUSH RIVETS

B - ALUMINUM BLOCK FASTENED TO (E) ELEVATOR SPAR (T.E.)

C - BRASS ROD JOINTED IN MIDDLE USING DRILL ROD AS HINGE PINS & DRILLED PARTWAY TO ACCEPT END OF BOWDEN CABLE WHICH IS SILVER SOLDERED TO ROD.

(D) SET SCREW TO FIX POSITION OF ALUMINUM TUBE (F) IN WHICH BRASS ROD SLIDES (C)

(E) ELEVATOR TRIM TAB SPAR

(F) ALUMINUM TUBE AFFIXED TO CABLE HOUSING AND PLACED IN DRILLED OUT BLOCK (B) TAP ONE END OF TUBING ABOUT 3/4" - 1" (COARSE THREAD) BOWDEN CABLE HAS NEOPRENE HOUSING WHICH WILL THREAD INTO TUBING

(G) HINGE - POP RIVETED TO TAB - SCREWED TO SPAR