

DURAND MARK V



NUMBER FOUR TO FLY

By John P. Foy (EAA 13794)
3801 127th N.E.
Bellevue, WA 98005

(Photos by the Author)

MY FIRST HOMEBUILT project was a T-18, the "Sly Tiger", which was written up in the February 1971 issue of *SPORT AVIATION*. Prior to that effort I had set down some guidelines for selecting a design I would be happy with. The primary one was choosing an experienced designer who had more than one successful aircraft actually flying. Other guidelines were as follows:

- Since I was starting with zero construction knowledge, any type of construction would have had the same difficulty factor, however, I leaned towards all-metal structure because, at the time, it was the most modern of the structures and withstood outside weather best.

- A single wing . . . as one would be enough to start with. I wanted to get an airplane flying within a reasonable time.

- Pop rivet construction so that one person could do the entire aircraft.

- I preferred a two-place, side-by-side design — since I had once owned a Cessna 120 and found I liked it better than a Cub or Champ in which I had to shout to rear seat passengers.

In the interim since the T-18 project, I had built a couple more aircraft and the experience gained during their construction and subsequent operation caused me to add to my list of guidelines.

- Wide cockpit, preferably 44 inches.
- Load carrying capability of 460 pounds **plus** fuel and oil.
- Designed around a standard aircraft engine.
- Grass and short field capability.

- A design that has been on the market and has had homebuilder's examples flying for at least three years.

The last one I consider to be most important for the novice builder to avoid discouragement and all kinds of troubles. Three years allows time for the builders to get the modification and mistake items back to the designer to correct the drawings.

A few years ago, I decided to build another airplane. I had tried composites but wanted to go back to metal construction. I ultimately narrowed my choices to the Zenair 300 and the T-18 (again). I had been gathering brochures and price lists, etc., when the November 1978 issue of *SPORT AVIATION* arrived containing the article by William H. Durand, "Introducing the Durand Mark V."

After reading the article I knew that I must follow up and check it out as the concepts were just what I was looking for. Also Bill's history gave me the confidence I needed to tackle his project.

A letter that same day introduced me to a very fine gentleman and his lovely wife and commenced a correspondence that I hope will last a lifetime. Mr. Durand's concepts have proven to be every bit as good as stated in his articles and I am well pleased with the finished product. Please note that speed was not a factor. For pleasure flying I prefer grass and short field capability to cross country speed since I get all the speed I want at work. If I have to get somewhere in a hurry and on a timetable, commercial transportation is the best.

All of which brings us to March 1979 when the first 20 of the 88 sheets of drawings arrived for the Durand

Mark V. And what a set of drawings! Up to that time the best I had ever seen was John Thorp's drawings for the T-18. Of seventeen sets of drawings for different aircraft, only two stand out for the beginner — the Throp T-18 and the Durand Mark V. Obviously, I have not seen all, but for the beginner, those two are the best I have come in contact with. Mr. Durand also has complete hardware lists, bill of materials lists, sheet utilization diagrams for cutting full sheets and many more items too numerous to mention. The drawings themselves are a work of art! Bill has drawings for the exhaust system, engine baffling, oil cooler mounting and oil cooler lines that have to be seen. Anyway, they are a joy to work with and I feel somewhat qualified to speak on the subject of drawings after completing four different aircraft.

Over the years I have acquired enough tools to get the job done — which means I have a lot of tools that the beginner won't have. Two of them are a four foot sheet metal brake, capable of bending .050-2024 T-3 aluminum and a TIG welder capable of welding 1/2" aluminum. The main landing gear carry-through on the Mark V is a heavy rectangular steel tube that requires TIG welding or comparable. Otherwise, all welding can be done with oxy-acetelene. (Also now available are all weldments necessary for the Mark V from Weldtech, Inc., Rt. 2, Box 2704, Benton City, WA 99320.) I also purchased an air operated pop riveter as the solid core pop rivets are something else to pull by hand!

The fuselage is a three part assembly: cockpit, baggage and cabane, and tail cone. The joining of the three assemblies could use a step by step description for alignment and



A sheet of aluminum skin for the author's Durand Mark V — cleaned, alodined, chromated, marked, taped and ready for cutting.

I believe Mr. Durand is working on a writeup now. Someone just has to have a better solution than the one I used!

Full sheets of aluminum were used, four feet by 12 feet for the most part, Scotch Brite rubbed, cleaned and alodined, zinc chromated, then marked according to the cutting diagrams with a felt tipped pen and one strip of masking tape laid over the marks to prevent scratching by the electric nibbler. Then the pieces were wrapped in brown paper and placed in a rack . . . after marking the pieces according to the drawing numbers, of course!

My shop is a 30 by 30 foot area and plenty large for one homebuilt. However, shortly after I really got into the Mark V, my brother decided to build a RV-4 in the same shop. Thank goodness we were progressing at different rates!

Building the Mark V is pretty much a one man job, but there are times when you just have to have four hands. Bending up the main spars had both my wife and me on the grunting ends of the brake.

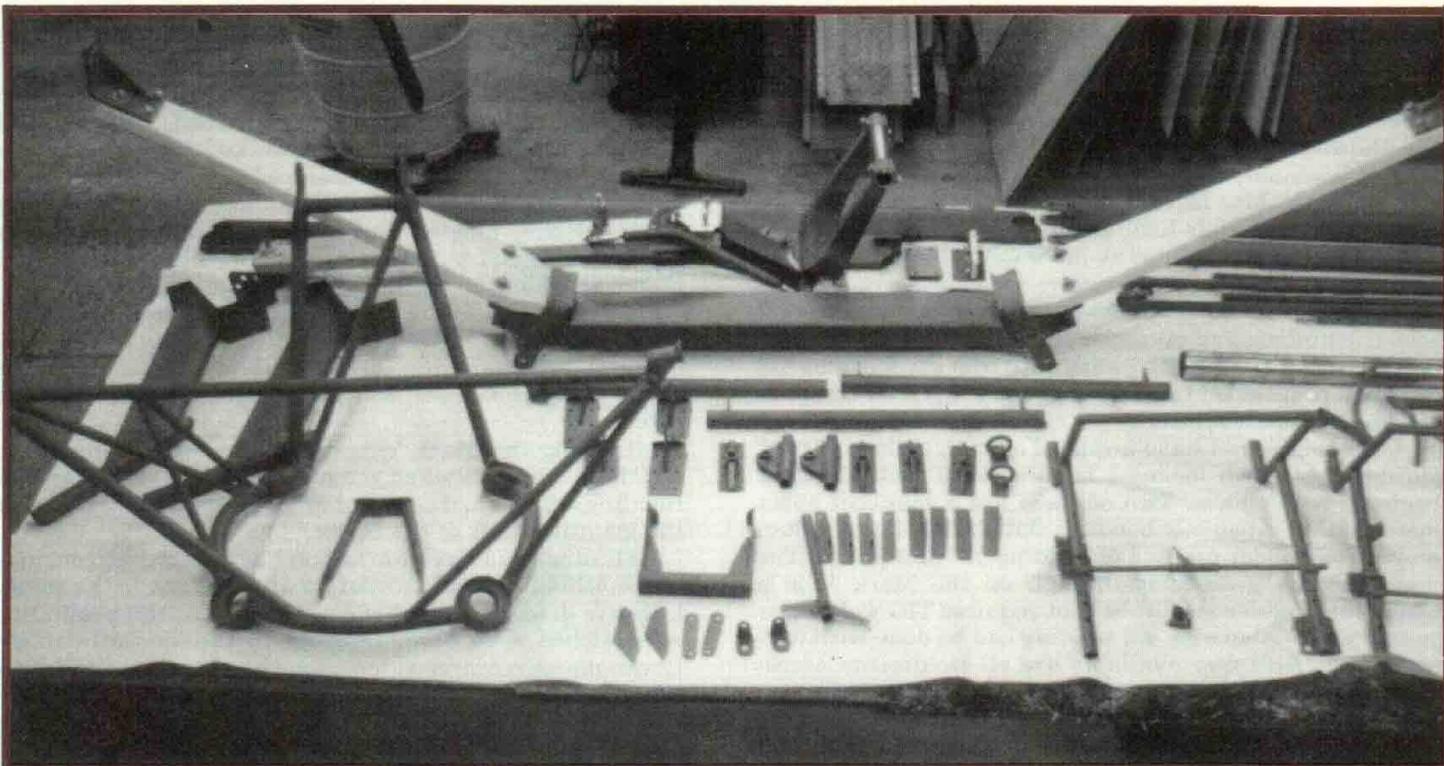
All canopies I have worked on have been time consuming, epithet producing monsters and this one is the same. I always dread that part of construction as the possibility of scratches is so high. Bending in the forward canopy Lexan pieces requires at least four hands and is done with the Lexan cold, as received from the dealer. The rear windows are also bent cold but I made mine a four-piece affair instead. Now I know that Lexan can also be bent in a press brake, which might make for a jazzy looking rear window.

The cost for a two-place homebuilt has increased five fold since my T-18 of 1969. The engine, radios, paint and propeller amount to more than half the total cost. I could have saved \$2,000 on the painting, but after painting three of my creations, I decided to let the pros do it since my shop wasn't equipped to do it right. If you're planning on any two-place homebuilt with a zero time engine, I'm afraid you will have to use up \$25,000. On the other end of the cost scale is Bill Durand's prototype at \$8400.00:

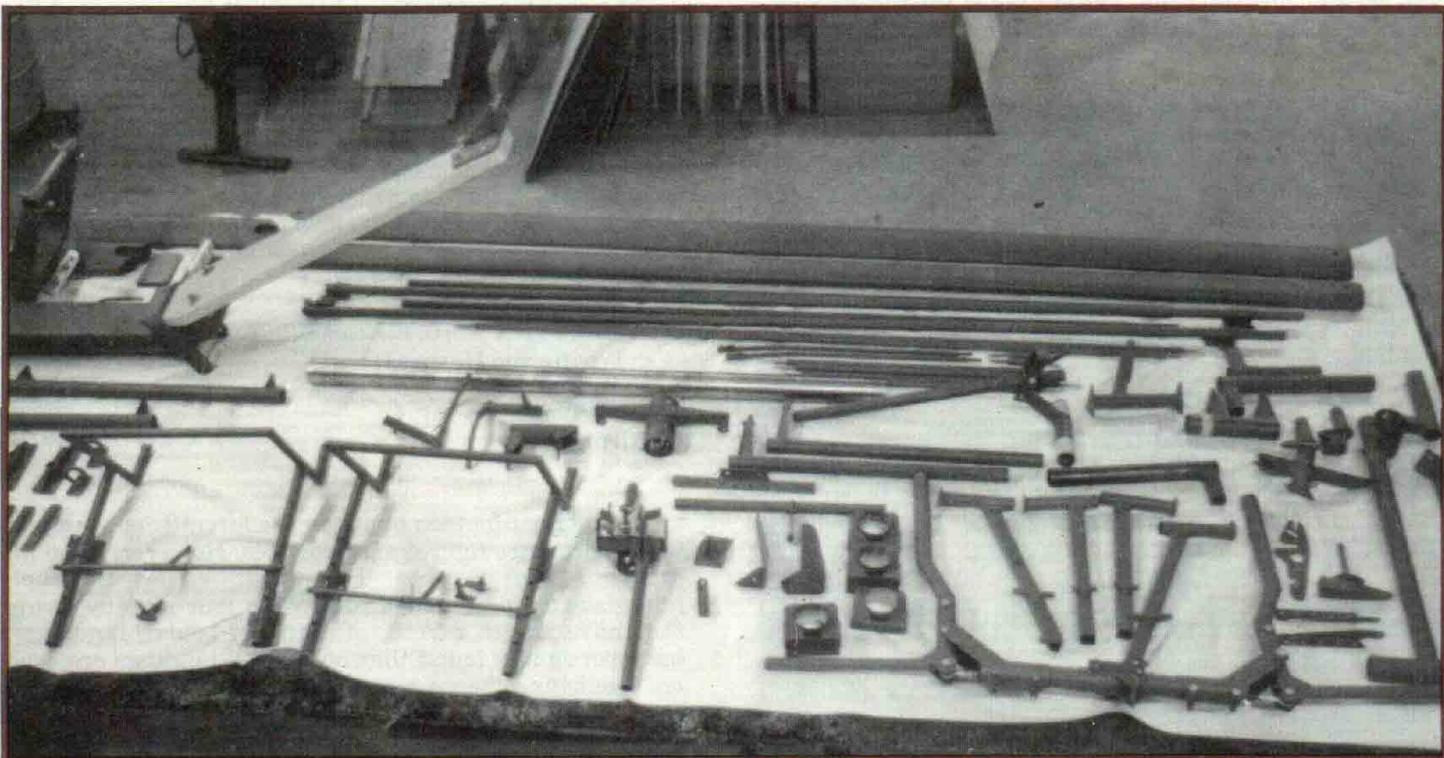
1. Engine — Lyc. 0-320-D3G —	
Remanufactured	\$ 7,288.16
2. Radios — KX 170B, KJ 208, KT 76A,	
Wiring and Harness	3,230.40
3. Painting	2,361.75
4. Propeller	460.00
5. All other	<u>12,159.69</u>
	\$25,500.00

With only nineteen hours on the aircraft, no meaningful performance figures are available. However, some impressions are possible. The Mark V has Scotchply fiberglass landing gear struts. With four already flying, they have proven capable of hard and bouncy landings. I have personally found that nosewheel landings are a no-no. The bounce keeps increasing in amplitude so nose up is the order of the day. Grass fields are delightful with that fiberglass gear. From the beginning, I have flown the Mark V without the spoiler return springs after Mr. Durand recommended their removal. The spoilers stay nicely tucked in their pockets from the air flow. I have yet to explore the stall series as our ceilings have been too low. The feel of spoilers I would classify as heavy compared to a T-18 or the RV-3 and -4, or about the same as a Champ or Cessna 150. Actually, I find myself using rudder more for turns and leaving the spoilers in their pockets. It's hard for me to tell the difference between conventional ailerons and spoilers as far as reactions go. Both seem to do the same job in this case! The flight visibility is amazing. The exhaust and muffler works just as advertised with most of the noise in the cabin due strictly to wind.

Which brings me to the Prince Aircraft "P" tip propeller. With a standard 70" x 56" prop of another make, I had



A layout of the weldments in a Durand Mark V, including the Scotchply landing gear legs.



to have the volume of my radio turned up full to hear the local traffic. With the "P" tip prop, I could turn the volume down to half. The Durand Mark V has an overhead speaker behind the pilot. All of the decibel meter readings don't mean much to me, but the volume knob of my radio does!

My empty weight on the aircraft certified scales was 1189.25 pounds — almost twenty pounds lighter than Mr. Durand's and probably due to the wooden prop versus the metal propeller on the prototype.

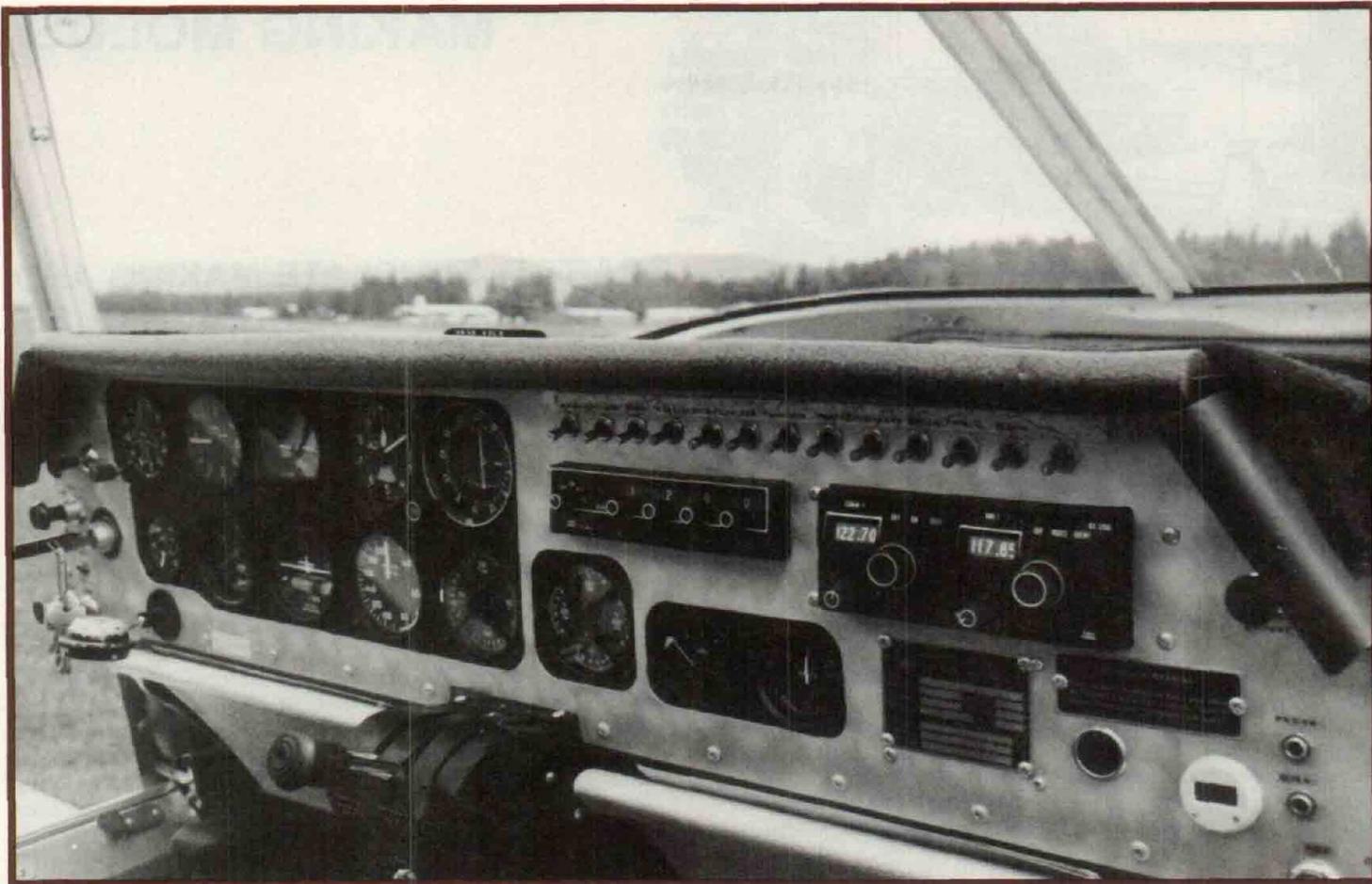
Overall impressions, so far, are of a quiet, well mannered aircraft suitable for cross country or around the

patch and at home on short grass or hardtop runways. Try it, I think you will like it!

To end this long winded effort, I would like to mention the cost of the engine I used in my Thorp T-18 purchased in January 1962, almost ready to fly. The front flange had to be removed.

January 1962	1 each 0-290-G	\$ 350.00
April 1983	1 each 0-320-D3G	7,288.16

To me, the above figures tell the story of inflation in the aircraft world. Total time in construction from March 1979 to February 1984 — 2548 hours.



Mark V cockpit details.

ABOUT THE AUTHOR, JOHN P. FOY

I soloed an Aeronca Champ in 1944, using up all the spare cash I had at the time. I graduated from high school in 1946, thus missing World War II — and the Aviation Cadet program — by one year. I started airline work as a steward on the Korean Airlift and hired on as a co-pilot with Northwest Airlines in June of 1952 — as soon as I had accumulated enough flight time to qualify. At the time ol' Whiskey Central was growing so fast that I had to have 1,000 hours before they would hire me. Their new hire co-pilots were checking out as captains three months after signing on!

In August of 1953 I was drafted by the U. S. Army — from airline co-pilot to truck mechanic in eight weeks! Back on the airline in 1955 I spent the next 34 years working my way up the seniority list, becoming a 747 captain along the way. How does 747 flying compare with light airplane flying? It doesn't! Airline flying is a job and, if done correctly, is hard work. Those who think it is great sport are entitled to their opinions. Light aircraft flying is the real sport for me, and I try to approach it as such.

I grew up on light airplanes and, to me, that is where the fun is. Building my own airplane was something I dreamed about from Day One until I accomplished it. The satisfaction is indescribable. It is something you have to experience to fully appreciate.

After high school I had intended to try for an aeronautical engineering degree, but was advised that working and going to school with all the returning G.I.s attending college on the G.I. Bill probably wouldn't work. Now that I'm looking towards retirement, perhaps it's time for me to get into engineering and design my own!

