CHAPTER
613
June 2006

(Chapter 613 web site)
www.eaa-chapter613.org

News and Views: Tom Edwards

I'm in Milton now with disarray everywhere. My apologies for the short newsletter and falling down on getting a brochure ready for the hangar fund campaign. Right now I don't have internet in my office so I need to run to the garage to hook up to the modem (satellite) and check my e-mail. My new e-mail address is eaglemountain@wildblue.net but I'll be checking both for the duration of my msn contract. This summer I'm taking 18 graduate credits for re-licensure so I can go back to teaching this fall.

Flight Advisor Corner: Hobie Tomlinson

June 2006

Flying with Floats – Part I (Seaplane Characteristics)

With the approach of summer and a renewed availability of seaplane training, I thought it would be interesting to do a series of articles on float plane flying. This is a larger topic than I have previously tackled, so I am not sure how many parts it will entail.

Obtaining a seaplane rating is a fun way to comply with the Biennial Flight Review requirement. There is even a **"Sea Wings**" program for those already rated, which also complies with the requirement for a BFR.

Seaplane training is available at several locations in Maine and is scheduled to be available with Hero Aviation (Doug Smith/Cub) on Lake Champlain this summer. I have flown at both Naples, Maine (Mary & Jim Build's/PA12s) and Turner, Maine (Twitchel's/C172s) and can recommend both.

Let's start our discussion with **where seaplanes fit** in the airman certification process. Unlike skiplanes (which come under the landplane class), **seaplanes require a separate class rating**. This will require an additional FAA flight test, but not another written test. The airplane class ratings are Single-Engine Land, **Single-Engine Sea**, Multiengine Land and **Multiengine Sea**.

Because **seaplanes are a separate class** of airplane, currency to carry passengers requires that **three takeoffs and landings be completed in a seaplane** within the last 90 days. Landplane currency does not carry over to seaplanes, or vice versa, but **a BFR in either is good for both.**

Seaplanes come in the following two varieties: hulled seaplanes (**flying boats**) and **floatplanes**. A second variation in seaplanes is whether they are only **seaplanes** or are **amphibians.** An example of a hulled amphibian is the Lake Buccaneer, while a Cessna 180 on "straight" floats is an example of a seaplane only. The term "straight" refers to non-amphibious floats. The addition of retractable landing gear to floats **greatly increases their weight, complexity, and cost—** not to mention the increase in insurance premiums. Thus people who have access to seaplane facilities tend to use "straight" floats. The big advantage of amphibians is the ability to keep the aircraft at a land airport (hangar) where it is

much easier to service and maintain. The recent availability of amphibious floats for the smaller aircraft has greatly expanded their use and popularity.

Flying boats have considerable handling differences from seaplanes, both on the water and in flight. Some causes of this are **High Thrust Line** (reversed thrust vector effect), **Higher C.G with pylon mounted engine** (stall/roll instability), **Different Stall/Spin Characteristics** (unusual low speed handling), **Higher Porpoising Tendency "On the Step"** (pitch instability), and **Different Wind Effects on the water** (fuselage/wing lower to water). Because of this, we will center our discussion on floatplanes, as these are what most of us will experience during training.

Some nautical terms which have common use in seaplanes are **port** (left) and **starboard** (right), **windward** (upwind) and **leeward** (downwind), and **bow** (front) and **stern** (rear).

Floats are usually constructed of aluminum, although fiberglass is sometimes used. They are basically designed like a boat hull with a strong keel running down the center of the bottoms and rounded sides with a deck that may be rounded or flat. The **Keel** provides the structure necessary for the float to support the seaplane on land (when taking seaplanes "out of the water" at the end of the season, many times they are just landed on grass at the airport and loaded on a dolly for transport to the hangar). The **Keel's** other function is to guide the float through the water, resisting sideways motion. A good description of float terms is found in the FAA Seaplane Operations Handbook, FAA-H-8083-23 and included below.

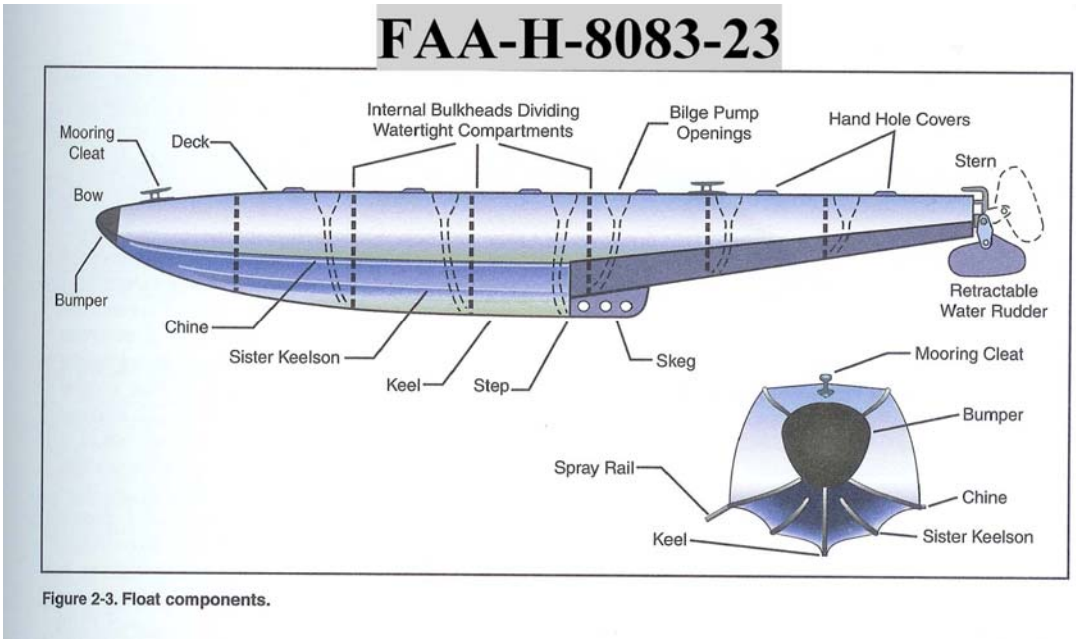

Figure 2-3. Float components.

Some differences from boat hulls are the **Step, Chine, and Spray Rails.** The **Step** is used to reduce water drag when hydrodynamic lift raises the after-body of the float out of the water at higher speeds. When this happens the seaplane is termed "**On the Step."** The **Step** also allows the pitch attitude of the seaplane to be varied (rotated) during takeoff. The **Step** is usually located just behind the C.G. (where the main gear would be located on a landplane). If it is located too far aft, rotation for takeoff on the water will be difficult. If located too far forward, the seaplane will rock back on the float afterbody when on land, damaging the floats. Although the step greatly reduces water drag, it increases aerodynamic drag

The **Chine** is where the bottom of the float is joined to the side. Its purpose is to guide water out and away from the float, reducing spray and improving **hydrodynamic lift** (hydrodynamic lift is the force produced by the float-induced motion of water as the float moves). Float bottoms are designed to provide maximum lifting force by diverting water (or air) downward. When the seaplane speed is increased on the water, the floats will create enough hydrodynamic lift to raise the float afterbody out of the water. This causes a large reduction in water drag, allowing the seaplane to accelerate to lift-off speed. **Spray Rails** are flanges designed to reduce the amount of spray striking the propeller, as water spray is incredibly destructive to propeller blades.

Rubber bumpers on the front of the float (usually the nose gear tire on amphibious floats) provide a cushion from minor impacts with docks. **Sister Keelsons** provide extra strength and rigidity to the structure of the float in addition to functioning as secondary keels. The **Skeg** strengthens the step area of the float, preventing damage when the float is taxied up a water ramp, as well as preventing the float from tipping backward when on land. The **Deck** provides a walking surface for entering and leaving the cabin, as well as providing hand hole covers, occasionally a storage compartment, bilge pump openings, and mooring cleats.

Float ratings (also usually model numbers) are based on the weight of the actual volume of fresh water they will displace. Fresh water is used for the standard because salt water is typically 3% denser and will support more weight for a given volume displacement. Thus floats such as Edo 2000s, will displace 2,000 pounds of fresh water each (4,000 lbs for the set) when completely submerged. Because a seaplane would never get out of the water if the floats were completely submerged, one requirement for float certification on any particular model of aircraft is that it have a fresh water buoyancy of 80% in excess of the maximum certificated gross weight of that specific seaplane.

A typical float on a Piper J3 would be 1320's. These will support an aircraft gross weight of 1,320 lbs, times 2, then divided by 1.8 equals 1,467 lbs. This is more than adequate for the maximum gross weight of the J3. Because a seaplane handles/performs better when the floats ride higher in the water, larger floats are often used (especially when the aircraft has been modified with a larger engine). A seaplane so equipped is termed **"Over Floated."**

Floats are required to have at least four watertight compartments, so the entire float will not flood if the bottom is damaged by a submerged obstruction or develops a leak. Because there is a requirement to support the seaplane with any two compartments flooded, floats typically have six or more compartments, thus making them much less likely to sink.

Watertight Covers are provided on float decks to provide access to the inside of each float compartment for inspection and maintenance. **Bilge Pump Openings** are small funnel shaped openings in each float compartment connected to the inside bottom (bilge) of that compartment by a tube. A small hand pump is inserted into the top opening to pump the water which leaks into each compartment out of that compartment bilge during preflight. The bilge opening is usually sealed by a small rubber ball when not being used to **"pump out"** the floats.

Water Rudders are attached to the rear of each float to provide low speed maneuvering capability on the water (when float buoyancy is supporting the seaplane). These are connected by cables and springs to the rudder pedals of the aircraft and function in conjunction with the aerodynamic rudder. Because water rudders are very susceptible to damage, they are retractable and **should be retracted in shallow water** where they might strike submerged objects or **when the seaplane is ramped/beached.** Water rudders are **also retraced for takeoff, landing or high speed taxi,** as the dynamic water forces at high speed will damage them.

Auxiliary Fins (secondary vertical stabilizers) are often added to the underside of the fuselage or horizontal stabilizers of floatplanes to help restore their directional (yaw) stability. This is because the installation of floats creates a large surface area ahead of the aircraft C.G., due to their length. The effect is greatly decreased yaw stability, which is partly restored by the installation of auxiliary fins. Seaplanes require less aileron pressure in a slip. They also may require more rudder pressure for coordinated turns because of the mechanical/aerodynamic effect of the water rudders in flight.

In Flight floatplanes act much like their landplane counterparts. The major difference being that the additional weight and drag of the floats substantially reduces the aircraft's performance and useful load verses its landplane counterpart. A second difference is that a seaplane will have an unusual "lateral" motion during turbulence, due to the C.G. with floats being lower than in a landplane.

This looks like a good place to break for this month. Next month we will resume with **Preflight** and **Taxiing.**

The thought for this month: **The big disadvantage with seaplanes is after you have finished crashing, you can still drown!** So, until next month, be sure to **Think Right to FliRite!**

Young Eagles: Donald Taylor

WE have only one pilot reporting YE flights for this month.

Chuck Robitelle	13
Donald Taylor	16
Steve Couzelis	5
Bill Yendrzeski	9
Bob Sterling	8
Don Nowakowski	1
George Coy	11

The total for this year is 63, just 237 more for this year!

Calendar of Events

August 2, 2006	Young Eagles, Springfield, VT Rain date August 3
August 12, 2006	EAA 740, Young Eagles, Lebanon, NH Call Marge @ 878-6337

RUTLAND EAA CHAPTER 968 EVENTS
June 17th: Annual Tail Dragger's Rendezvous Fly-In Breakfast at RUT. (raindate June 18)

Date TBD: Hike to the Camel's Hump B-24 crash site with aviation historian and crash-site sleuth Brian Lindner. Fascinating and strenuous(!!) trip and I've heard of some interest in doing it again. If enough people would like to go I thought that late September or into early October might be a good time and I would ask Brian if he would like to take us. Please let me know of your enthusiasm.

Favorite Links

www.vermontairports.com www.greenmountainflyers.org
www.aflyer.com www.eaa.org

New ATC Weather Descriptions Hobie Tomlinson Flight Advisor

Subject: New Weather Phraseology for ATC

I can't remember if this information has been disseminated or not. Effective May 11th, 2006 per FAA Notice 7110.441 all Terminal ATC facilities that have the capability of displaying 6 weather levels will now use the following intensities to describe the weather returns.

If the weather level is level 1, it is now referred to as Light Precipitation.
If the weather level is level 2, it is now referred to as Moderate Precipitation.
If the weather level is level 3-4, it is now referred to as Heavy Precipitation.
If the weather level is level 5-6, it is now referred to as Extreme Precipitation.

Please pass this information along to all pilots.

CHAPTER 613
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FIRST CLASS MAIL

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