

**9.1 AEROCET 1500 AMPHIBIOUS FLOATS**

**LOG OF REVISIONS**

| <b>Rev</b> | <b>Pages</b> | <b>Date</b> | <b>Description of Revision</b> |
|------------|--------------|-------------|--------------------------------|
| 0          | ALL          | 12/12/14    | Initial Release                |
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### **9.1.1 GENERAL**

This supplement must be attached to the Pilot's Operating Handbook when floats are installed. The information contained herein supplements or supersedes the Pilot's Operating Handbook only in the areas listed in this supplement. For limitations, procedures and performance information not contained in this supplement, consult Section 2 of the Pilot's Operating Handbook. It should be noted that these floats are "experimental" and as such there is no warranty to their compliance to either the ASTM or Part 23 Standards.

### **9.1.2 FUEL QUANTITY INDICATORS**

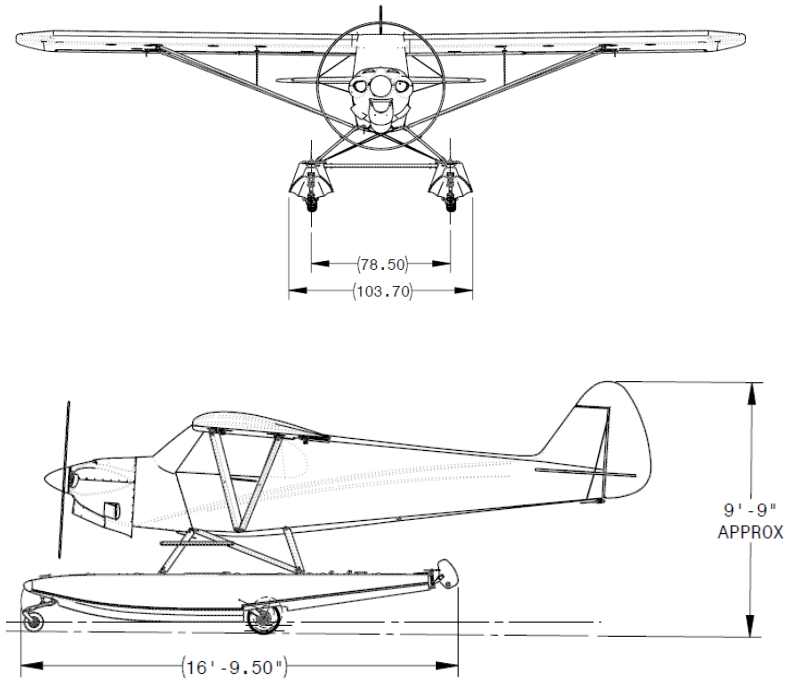
To determine the fuel quantity when equipped with floats, use the fuel quantity indication for level flight. Fuel indications in the water will vary depending on the angle at which the aircraft is floating. Generally, using the markings for level flight will ensure that the amount of fuel available is greater than what is shown on the gauges.

### **9.1.3 BILGE PUMP**

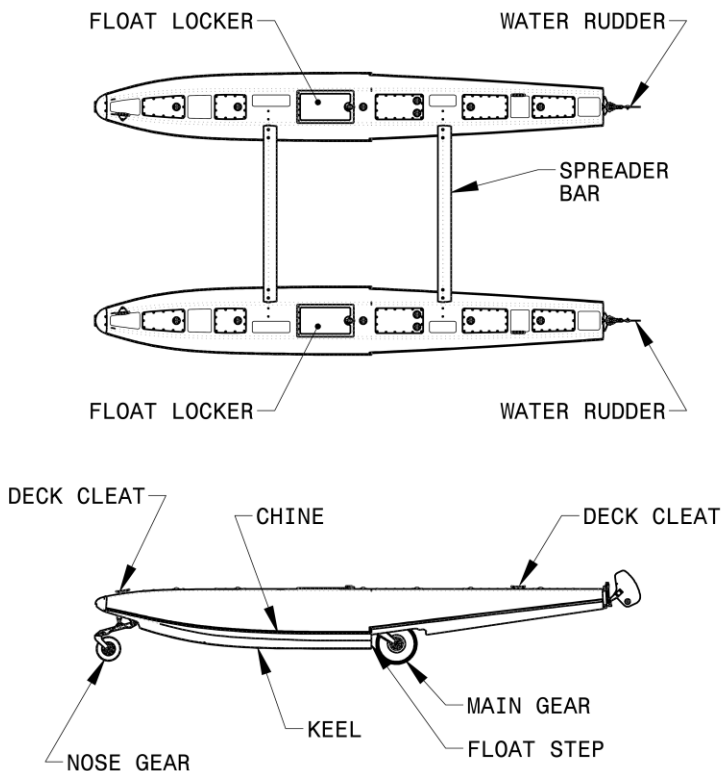
There is a bilge pump stowed in a float locker. Any water that has accumulated in the floats may be emptied out by removing the rubber plugs and using the pump to draw the water out. Make sure that no one is standing in the way of the water stream.

### **9.1.4 FLOAT COMPARTMENTS**

There are 6 water tight compartments on each float, 1 of which is a storage locker on each float.



**Figure 9-1-1 View of the Aircraft with Floats**



**Figure 9-1-2 View of Floats**

**9.1.5 LIMITATIONS**

**9.1.5.1 GENERAL**

This section provides the recommended operating limitations, instrument markings, color-coding and basic placards for operation that are specific to the Cub Crafters' CC11-160 when equipped with floats. By ELSA classification, the owner may establish his/her own limitations, etc., but may not fly above the established ELSA weight requirement.

Please refer to Section 2 of the aircraft flight manual for the complete list of operating limitations, instrument markings, color-coding and basic placards for operation that are common to the landplane and seaplane.

**AIRSPPEED LIMITATIONS**

| <u>INDICATED AIRSPEED (IAS)</u>                       | <u>MPH</u> | <u>KNOTS</u> |
|---|------------|--------------|
| Never exceed speed ( $V_{NE}$ )                       | 141        | 123          |
| Operating maneuvering speed ( $V_A$ )<br>(at 1430 lb) | 97         | 84           |
| Maximum Flap Speed ( $V_{FE}$ flaps 50°)              | 81         | 70           |
| Best Rate of Climb Speed ( $V_Y$ )<br>(at 1430 lb)    | 71         | 62           |
| Best Angle of Climb Speed ( $V_X$ )<br>(at 1430 lb)   | 50         | 43           |

Maximum Demonstrated Crosswind Velocity..... 11 kts

Maximum Demonstrated Wave Height ..... 1 ft

**9.1.5.2 CENTER OF GRAVITY**

- Position of Datum..... 60 inches ahead of wing leading edge
- Maximum Gross Weight ..... 1430 lb.
- Maximum Float Baggage 80lb./each float locker

Center of Gravity Limits at 1430 lb.

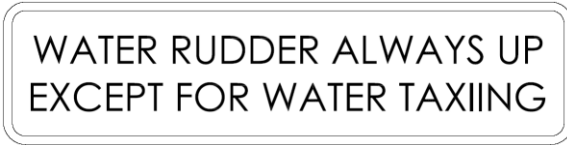
- Forward .....73.0 in. aft of datum
- Aft .....78.5 in. aft of datum

Center of Gravity Limits at 1100 lb. or less

- Forward .....70.5 in. aft of datum
- Aft .....78.5 in. aft of datum

**9.1.5.3 PLACARDS**

Locate near water rudder retraction handle stowage hook:



Or

"WATER RUDDER  
ALWAYS UP  
EXCEPT  
WATER TAXIING"

On hydraulic hand pump cover at gear selector handle:





## **9.1.6 EMERGENCY PROCEDURES**

### **9.1.6.1 GENERAL**

This section provides the procedures recommended when encountering an emergency or a critical situation as related specifically to operations when the floats are installed. It is highly recommended to establish one's own numbers for emergency conditions in lieu of the ELSA (experimental) classification. Again, this is a recommendation only. For all other emergency procedures outside of float operations, refer to Section 3 of the regular flight manual.

This section is divided into two parts. The first contains emergency procedure checklists. The second part amplifies the items listed in the checklists and includes information that is not readily adaptable to a checklist format or which the pilot could not be expected to refer to in an emergency situation. This information should be reviewed regularly.

Pilots must familiarize themselves with the procedures in this section and must be prepared to take appropriate action should an emergency arise.

It is stressed that the procedures outlined in this section are recommendations only. They are not a substitute for sound judgment and common sense and may have to be adjusted depending on the circumstances prevailing at the time of the emergency. It is important that the pilot be thoroughly familiar with the aircraft. He/She must review and practice as many of these procedures as are safe to perform as part of his/her training. Above all, in any emergency situation, **MAINTAIN CONTROL OF THE AIRCRAFT.**

**AIRSPEEDS FOR EMERGENCY OPERATIONS**

STALL SPEEDS (1430 lb)

| <u>INDICATED AIRSPEED (IAS)</u>             | <u>MPH</u> | <u>KNOTS</u> |
|---|------------|--------------|
| Flaps up ( $V_{S1}$ ).....                  | 40         | 35           |
| Flaps down ( $50^\circ$ ) ( $V_{S0}$ )..... | 32         | 28           |
| BEST GLIDE ( $V_G$ )                        |            |              |
| Flaps up (1430 lb.).....                    | 68         | 59           |

**9.1.6.2 EMERGENCY CHECKLIST**

**9.1.6.2.1 Emergency Landing on Water without Engine Power**

| <u>INDICATED AIRSPEED (IAS)</u>  | <u>MPH</u>       | <u>KNOTS</u> |
|----------------------------------|------------------|--------------|
| ▪ Approach (flaps up)..... $V_G$ | 68               | 59           |
| ▪ Seat Belts                     | Tight and secure |              |

When landing area assured:

- Flaps.....As required
- Gear ..... Up(ck lights and mirrors)
- Door..... Open
- ELT..... Activate
- Touchdown .....Slightly tail low
- Control Stick..... Progress to full aft after touchdown

When aircraft comes to a stop:

- Magnetos/Ignition ..... Off
- Master Switch ..... Off
- Fuel Selector ..... Off

If time permits, check GPS or charts for airports in the immediate vicinity. If possible, notify your difficulty and intentions by radio on 121.50 and/or squawk 7700.

**9.1.6.2.2 Emergency Landing on Land without Engine Power**

| <u>INDICATED AIRSPEED (IAS)</u>  | <u>MPH</u>                           | <u>KNOTS</u> |
|----------------------------------|--------------------------------------|--------------|
| ▪ Approach (flaps up)..... $V_G$ | 68                                   | 59           |
| ▪ Seat Belts.....                | Tight and secure                     |              |
| ▪ Flaps .....                    | As required                          |              |
| ▪ Gear .....                     | Down (ck lights and mirrors)         |              |
| ▪ Door .....                     | Open                                 |              |
| ▪ ELT .....                      | Activate                             |              |
| ▪ Touchdown.....                 | Level attitude                       |              |
| ▪ Control Stick.....             | Progress to full aft after touchdown |              |

When aircraft comes to a stop:

- Magnetos/Ignition ..... Off
- Master Switch..... Off
- Fuel Selector..... Off

If time permits, check GPS or charts for suitable landing areas in the immediate vicinity. If possible, notify your difficulty and intentions by radio on 121.50 and/or squawk 7700.

**9.1.6.2.3 Landing Gear Fails to Retract or Extend**

If possible, cycle the gear to address the problem. If the problem is unable to be corrected, leave the gear lever in the down position and allow time for the gear to deploy by gravity. Reducing speed will help the main gear to come down. Always land on land and never on water under these conditions.

**– WARNING –**  
**Landing on water with the gear down or partially down will be catastrophic and will likely cause injury or death.**

### **9.1.6.3 AMPLIFIED EMERGENCY PROCEDURES**

#### **9.1.6.3.1 Total Loss of Engine Power in Flight**

The aircraft with floats will glide approximately 1.1 nautical miles for every 1000 feet of altitude loss. The rate of descent will be approximately 890 feet per minute. Most GPS devices have a “Direct to” function that shows the closest airports. Use charts to assess the topography of airports in the immediate vicinity.

#### **9.1.6.3.2 Emergency Landing on Land without Engine Power**

When having to make an emergency landing on land the pilot should use his/her best judgment to find the most suitable surface for landing. Touchdown should be level attitude if gear is up and slightly tail low if gear is down.

|  |
|--|
| <p style="text-align: center;"><b>WARNING</b><br/><b>DO NOT ATTEMPT TO LAND ON WATER UNLESS</b><br/><b>ALL FOUR WHEELS ARE IN THE RETRACTED</b><br/><b>POSITION.</b></p> |
|--|

## **9.1.7 NORMAL PROCEDURES**

### **9.1.7.1 INTRODUCTION**

This section describes the procedures recommended for the pilot to follow during normal operations of the aircraft on floats. It is divided into two parts. The first has abbreviated checklists; these are in a format suitable for reference in the cockpit. The second part amplifies the information given in the checklists. It provides the pilot with detailed descriptions that will help him/her understand the procedures and techniques. This section contains complete checklists so that the pilot can carry out these activities without having to turn back and forth in this manual.

### **9.1.7.2 AIRSPEEDS FOR NORMAL OPERATIONS**

The speeds in this section are based on a maximum weight of 1430 lb, under standard conditions, at sea level.

### **9.1.7.3 MAXIMUM WAVE HEIGHT**

Maximum Demonstrated Wave Height..... 1 ft

### **9.1.7.4 NORMAL PROCEDURES CHECKLIST**

For ease of operation, this supplement will provide the complete checklist.

**9.1.7.4.1 Cockpit Preflight**

- Flight Controls ..... Free and correct operation
- Trim ..... Check operation and set for takeoff
- Fuel Selector ..... Both
- Flaps..... Proper operation
- Fuel Gauges .....Sufficient fuel for intended flight  
(Use level flight indications for float operation)
- Mixture..... Idle cut-off
- Carburetor Heat..... Cold
- Magnetos/Ignition ..... Off
- Ignition Backup Battery ..... Normal
- Electrical Switches..... Off
- Landing Gear Selector.....Up for Water  
Down for Land  
(Check for firm pressure on the pump handle)
- Water Rudders ..... Check operation and set  
(Up for land- ensure handle is stowed)  
(Down for Water)
- Master Switch ..... On
- Navigation/Strobe Lights..... Check operation
- Landing Light ..... Check operation
- Stall Warning Horn..... Check operation
- Master Switch ..... Off
- Circuit Breakers ..... Check in
- Windows ..... Clear
- Documentation ..... Onboard

If passenger seat unoccupied

- Passenger Seat Harness .....Secure

**9.1.7.4.2 Preflight Right Fuselage, Wing, and Float**

- Right Fuselage .....Check
- Fuel Sump ..... Drain
- Flap Surface .....Check condition
- Flap Hinges .....Check
- Aileron Surface .....Check condition
- Aileron Hinges .....Check
- Wing Tip and Light.....Check
- Vortex Generators .....Check
- Fuel Cap Vent .....Check
- Fuel Tank .....Check supply and cap for security
- Water Rudder and Cables.....Check,  
Extend- retract
- Main (45psi) and Nose Gear (70psi) (Amphibious  
Only).....Check
- Float .....Check for damage and water accumulation  
(Use bilge pump as necessary)

**NOTE**

Remove rubber plugs which serve as stoppers on the standpipe in each float compartment and pump out any accumulation of water. Reinstall rubber plugs with enough pressure for a snug fit. If excessive amounts of water, begin investigation for damage. Observe how the plane is floating indicating a possible leaking or damaged float bay. Red in the water means a hydraulic leak.

- Bilge Rubber Plugs .....Secure
- Oar ..... Check stowed and secure
- Float Hatches .... Cargo secure and hatches latched

**9.1.7.4.3 Preflight Nose Section**

- Oil Door ..... Open
- Oil Quantity ..... Check and cap secure
- Engine Condition ..... Check
- Oil Door ..... Close
- Propeller and Spinner ..... Check
- Air Inlets ..... Check
- Fuel Strainer (in front of firewall on left) ..... Drain
- Fuel Drain (behind firewall on left) ..... Drain\*

\*For aircraft S/N 00264 and on only

**9.1.7.4.4 Preflight Left Fuselage, Wing, and Float**

- Float Hatches ....Cargo secure and hatches latched
- Main (45psi) and Nose Gear (70psi) (Amphibious Only)..... Check
- Float .....Check for damage and water accumulation  
(Use bilge pump as necessary)

**NOTE**

Remove rubber plugs which serve as stoppers on the standpipe in each float compartment and pump out any accumulation of water. Reinstall rubber plugs with enough pressure for a snug fit. If excessive amounts of water, begin investigation for damage. Observe how the plane is floating indicating a possible leaking or damaged float bay. Red in the water means a hydraulic leak.

- Bilge Rubber Plugs ..... Secure
- Fuel Tank .....Check supply and cap for security
- Fuel Cap Vent..... Check
- Landing Light ..... Check condition
- Pitot Tube ..... Check condition
- Stall Warning Vane ..... Check condition
- Wing Tip and Light..... Check condition
- Vortex Generators ..... Check



- Aileron Hinges.....Check
- Aileron Surface.....Check condition
- Flap Hinges.....Check
- Flap Surface.....Check condition
- Water Rudder and Cables .....Check
- Left Fuselage.....Check

**9.1.7.4.5 Empennage**

- Bracing Wires..... Check for tension
- Hinges.....Check
- Surfaces.....Check

**9.1.7.4.6 Preflight General**

Check that all wings and other external surfaces are free from frost, ice or snow.

**9.1.7.4.7 Startup and Taxi**

- Preflight Inspection.....Complete
- Pilot Seat..... Adjusted
- Seat Belts..... Fastened
- Passenger Briefing .....Complete
- Door .....Closed
- Fuel Selector ..... Both
- Avionics Master Switch..... Off
- Water Rudders ..... Down for water
- Landing Gear..... Up for Water  
Down for Land
- Propeller Area ..... Clear

**9.1.7.4.8 Starting Engine**

- Battery Master Switch..... On
- Check Gear Advisory.... Cancel any advisory audio  
.....Press Test to check lights
- Strobes..... On
- Magneto/Ignition Switches.....Both on
- Mixture ..... Full rich

- Primer.....Apply (3 times if cold, omit if hot)
- Throttle .....Open 1/2 inch
- Starter..... Engage

After engine has started:

- Oil Pressure..... Check
- Throttle .....Set 1000 RPM
- Lights..... As required
- Avionics Master Switch.....On

**9.1.7.4.9 Starting Engine When Flooded**

- Magneto/Ignition Switches..... Both on
- Mixture..... Idle cut-off
- Throttle ..... Full open
- Starter..... Engage

When engine fires:

- Mixture..... Rich
- Throttle ..... Retard to 1200 RPM
- Oil Pressure..... Check
- Lights..... As required
- Avionics Master Switch.....On

**9.1.7.4.10 Warm up**

- Throttle ..... 1000 to 1200 RPM

**9.1.7.4.11 Taxiing**

- Taxi Area ..... Clear
- Throttle ..... Apply slowly

**9.1.7.4.12 Before Takeoff**

- Flight Instruments ..... Check
- Magnetos/Ignition ..... Both
- Carburetor Heat..... Off (cold)
- Trim ..... Set
- Landing Gear..... Up for Land

Down for Land

(Ck for firm pressure on pump handle)

- Flaps .....Second notch (35°)
- Controls..... Free and proper movement
- Doors.....Closed
- Strobes and Lights.....As required
- Seat Belts..... Check fastened
- Throttle .....1700 RPM\*
- Mixture ..... Set\*
- Magnetos/Ignition ..... Check both

**NOTE:**

Drop not to exceed 150 RPM or 75 RPM differential between magnetos and no engine roughness. For electronic ignition, little or no drop will be noted.

- Carburetor Heat.... Hot, note RPM drop and remove
  - Primer..... Locked
  - Engine Instruments.....Check
- \* Lean at high altitudes for peak RPM.

**9.1.7.4.13 Takeoff**

- Water Rudders ..... Check Up
- Landing Gear ..... Up for Water  
Down for Land
- Control Stick..... Full Aft
- Throttle..... Full
- Control Stick..... Move forward  
On water, when the nose stops rising to attain the planing attitude (on the step).
- Accelerate to flying speed (depending on aircraft weight)
- Control Stick..... Gentle back pressure
- Landing Gear ..... Up for Water  
Down for Land
- Flaps ..... Retract slowly after liftoff

**9.1.7.4.14 Climb**

| <u>INDICATED AIRSPEED (IAS)</u> | <u>MPH</u> | <u>KNOTS</u> |
|---------------------------------|------------|--------------|
| ▪ Best Rate.....                | 71         | 62           |
| ▪ Best Angle.....               | 50         | 43           |
| ▪ Mixture .....                 |            | Rich         |

As required, LEAN to obtain maximum RPM:

- Carburetor Heat..... As required

**9.1.7.4.15 Cruise**

- Power.....Adjust
- Mixture .....
- Carburetor Heat..... Cold, use as required

**9.1.7.4.16 Descent**

- Power.....Adjust
- Mixture .....
- Carburetor Heat..... As required

**9.1.7.4.17 Approach**

- Fuel Selector .....
  - Seat Belts.....Fastened
  - Mixture .....
  - Flaps .....
- | <u>INDICATED AIRSPEED (IAS)</u>       | <u>MPH</u> | <u>KNOTS</u> |
|---------------------------------------|------------|--------------|
| Maximum speed first notch flaps (15°) | 85         | 74           |
| Maximum speed (>15°)                  | 81         | 70           |
- Trim..... As required
  - Speed..... As required  
(1.3 full flaps stall speed at gross weight is 42 mph or 37 knots IAS)

**9.1.7.4.18 Landing**

- Water Rudders ..... Check up
- Landing Gear ..... Up for Water  
Down for Land (cancel condition on advisory)
- Control Stick..... Hold full aft as aircraft  
decelerates to taxi speed

**- WARNING -  
IF WHEELS ARE IN DOWN POSITION DURING A  
WATER LANDING, THE AIRCRAFT WILL FLIP OVER.  
ENSURE WHEELS ARE UP FOR ALL WATER  
LANDING.**

**9.1.7.4.19 Cross Wind Landing**

- Fuel Selector ..... Both
- Seat Belts..... Fastened
- Mixture ..... Set
- Flaps ..... Set below white arc  

| <u>INDICATED AIRSPEED (IAS)</u>       | <u>MPH</u> | <u>KNOTS</u> |
|---------------------------------------|------------|--------------|
| Maximum speed first notch flaps (15°) | 85         | 74           |
| Maximum speed (>15°)                  | 81         | 70           |
- Trim..... As required
- Speed ..... As required  
(A higher speed than normal is recommended)
- Water Rudders ..... Check up
- Landing Gear ..... Up for Water  
Down for Land
- Ailerons-Rudder ..... On short final  
Use ailerons to keep upwind wing low  
Rudder to hold landing area alignment
- Touchdown ..... Do not touch down in a slip
- Landing Roll ..... Use ailerons to keep upwind  
wing down, rudder to keep directional control as  
appropriate, water rudders down (water only)

**9.1.7.4.20 Go-Around**

- Throttle ..... Full power
- Airspeed ..... Above 52 mph  
or 45 Knots
- Landing Gear ..... Retract
- Flaps ..... Retract slowly
- Trim ..... As required

**9.1.7.4.21 Stopping Engine**

- Flaps ..... Retract
- Electrical Equipment ..... Off
- Avionics Master Switch ..... Off
- Throttle ..... Idle
- Mixture ..... Idle cut off
- Magnetos/Ignition ..... Off
- Master Switch ..... Off

## **9.1.8 WEIGHT AND BALANCE**

### **9.1.8.1 INTRODUCTION**

This section provides the position of the center of gravity relative to the datum. It also describes how to calculate the empty weight of the aircraft based on data for the landplane. Should it be necessary to weigh the aircraft on floats, please consult the maintenance manual.

### **9.1.8.2 PERTINENT INFORMATION FOR WEIGHT AND BALANCE OF THE CC11-100 AIRCRAFT EQUIPPED WITH FLOATS**

Position of Datum..... 60 inches ahead  
of wing leading edge

Maximum Gross Weight..... 1430 lb.  
Maximum Float Baggage ..... 80lb./each float locker  
..... (160 lb. Total)

Center of Gravity Limits at 1430 lb.  
Forward..... 73.0 in. aft of datum  
Aft ..... 78.5 in. aft of datum

Center of Gravity Limits at 1100 lb. or less  
Forward..... 70.5 in. aft of datum  
Aft ..... 78.5 in. aft of datum

**9.1.8.3 DETERMINATION OF EMPTY WEIGHT**

The empty weight and the position of the center of gravity are recorded in Section 6 of this manual.

The weight and moments of the floats are given in Table 9-1-1. If there is any difficulty or concern in values listed, performing an actual weight and balance is recommended.

| <b>Item</b>                            | <b>Weight lb.</b> | <b>Arm in.</b> |
|--|-------------------|----------------|
| Amphibious floats with attachment gear | 257<br>(approx.)  | 76.3           |
| Pump System                            | 2.75              | 65             |
| Rudder Bar and Springs                 | .6                | 253            |
| Steps                                  | 4.5               | 65.4           |
| Total: Empty with Amphibious Floats    |                   |                |

**Table 9-1-1 - Weight of Amphibious Floats**

**9.1.8.4 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT**

In order to calculate the weight and balance of the aircraft:

1. Insert the respective loads in Table 9-1-3 or Table 9-1-4.
2. Multiply each load by its respective arm and note the moment.
3. Add the loads to calculate the takeoff weight.
4. Add the moments to compute the total moment.



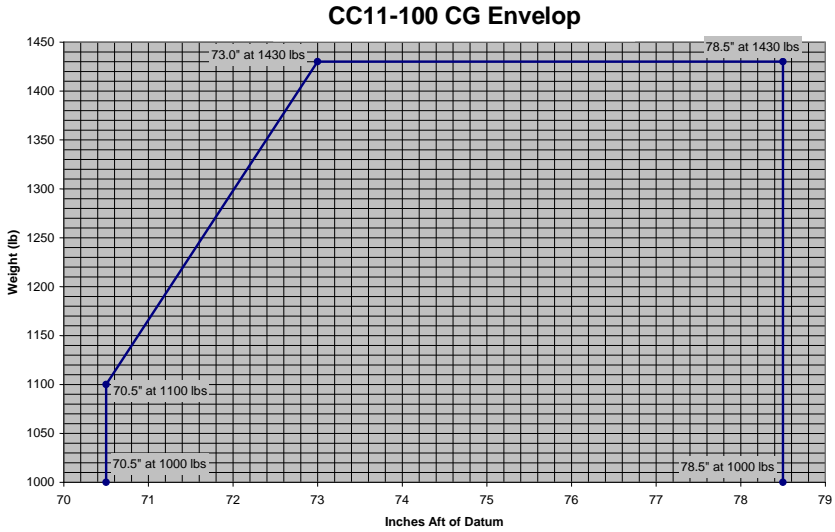
5. Divide the moment by the takeoff weight. This is the final position of the center of gravity.
6. Plot the point on Figure 9-1-2. If it is within the weight and balance envelope, the aircraft is within the approved envelope.

|   | Weight<br>(lb.) | Arm<br>(in.) | Moment<br>(lb-in) |
|---|-----------------|--------------|-------------------|
| Basic empty weight                        |                 |              |                   |
| Float hatches (standard)                  |                 | 71.40        |                   |
| Pilot                                     |                 | 71.40        |                   |
| Passenger                                 |                 | 96.08        |                   |
| Fuel                                      |                 | 83.90        |                   |
| Forward cargo compartment<br>(100 lb max) |                 | 110.40       |                   |
| Cargo shelf compartment<br>(20 lb max)    |                 | 134.40       |                   |
|   |                 |              |                   |
| Takeoff weight                            |                 |              |                   |

**Table 9-1-1 –Weight and Balance Loading Form with Floats**

|   | Weight<br>(lb.) | Arm<br>(in.) | Moment<br>(lb-in) |
|---|-----------------|--------------|-------------------|
| Basic empty weight                        |                 |              |                   |
| Float hatches (standard)                  |                 | 71.40        |                   |
| Pilot                                     |                 | 71.40        |                   |
| Fuel                                      |                 | 83.90        |                   |
| Forward cargo compartment<br>(100 lb max) |                 | 110.40       |                   |
| Extended cargo compartment<br>(60 lb max) |                 | 138.40       |                   |
|   |                 |              |                   |
| Takeoff weight                            |                 |              |                   |

**Table 9-1-2 –Weight and Balance Loading Form with Floats  
Extended Cargo Compartment**



**Figure 9-1-2 - Weight and Balance Envelope with Floats**

**9.1.9 PERFORMANCE**

These floats are “experimental” and as such there is no warranty to their compliance to either the ASTM or Part 23 Standards. Therefore, performance information is not required and is not available at this time. Pilots are advised that takeoff and landing rolls will be increased from standard landing gear due to additional weight.

All values listed are at gross weight under standard sea level conditions. The charts below should be filled in by the owner in order to establish working numbers for the aircraft. Propeller, engine capability, etc. are all variables unique to each aircraft.

**9.1.9.1 CLIMB**

| Pressure Altitude (ft) | IAS |       | Rate of Climb |
|------------------------|-----|-------|---------------|
|                        | MPH | Knots |               |
| 1,000                  | 70  | 61    |               |
| 2,000                  | 70  | 61    |               |
| 3,000                  | 70  | 61    |               |
| 4,000                  | 71  | 62    |               |
| 5,000                  | 71  | 62    |               |
| 6,000                  | 71  | 62    |               |
| 7,000                  | 71  | 62    |               |
| 8,000                  | 72  | 63    |               |
| 9,000                  | 72  | 63    |               |
| 10,000                 | 72  | 63    |               |
| 11,000                 | 72  | 63    |               |
| 12,000                 | 73  | 63    |               |

**9.1.9.2 Takeoff/Landing-Wheels**

| Wheel   |              | Distance |
|---------|--------------|----------|
| Takeoff | Roll         |          |
|         | 50' Obstacle |          |
| Land    | Roll         |          |
|         | 50' Obstacle |          |

**9.1.9.3 Takeoff/Landing-Water**

| <b>Water</b> | <b>Condition</b> | <b>Distance</b> |
|--------------|------------------|-----------------|
| Takeoff      | Roll             |                 |
|              | 50' Obstacle     |                 |
| Land         | Roll             |                 |
|              | 50' Obstacle     |                 |