Vx angle 56
Vy rate 72
Va maneuver 105
Vg best glide 70

Vapch 65-75
Vapchflaps 55-65 60kt 40°
DTO 1195'/1940' 20°C/SL
DTO 2775'/4260' 40°C/4000'
DLDG 620'/1340' 20/SL
DLAG 830'/1588' 40/4000

Vclimb 60-70 enroute 80-90

"TAKE YOUR CESSNA HOME FOR SERVICE AT THE SIGN OF THE CESSNA SHIELD"

CESSNA AIRCRAFT COMPANY
WICHITA, KANSAS

D1098-13

PILOT'S OPERATING HANDBOOK

SUPPLEMENT

Cessna 1977

Hawk XP

FLOATPLANE

CESSNA MODEL R172K

THIS SUPPLEMENT INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY CAR PART 3.

COPYRIGHT © 1991
Cessna Aircraft Company
Wichita, Kansas USA

PERFORMANCE-SPECIFICATIONS

SPEED:		
Maximum at Sea Level		118 KNOTS
Cruise, 80% Power at 6000 Ft		116 KNOTS
CRUISE: Recommended lean mixture with fuel allowance for engine start, taxi, takeoff, climb and 45 minutes reserve at 45% power.		
80% Power at 6000 Ft	Range	430 NM
49 Gallons Usable Fuel	Time	3.7 HRS
Maximum Range at 10,000 Ft	Range	500 NM
49 Gallons Usable Fuel	Time	5.6 HRS
RATE OF CLIMB AT SEA LEVEL		870 FPM
SERVICE CEILING		15,500 FT
TAKEOFF PERFORMANCE:		
Water Run		1135 FT
Total Distance Over 50-Ft Obstacle		1850 FT
LANDING PERFORMANCE:		
Water Run		660 FT
Total Distance Over 50-Ft Obstacle		1325 FT
STALL SPEED (CAS):		
Flaps Up, Power Off		50 KNOTS
Flaps Down, Power Off		44 KNOTS
MAXIMUM WEIGHT		2550 LBS
STANDARD EMPTY WEIGHT:		1770 LBS
MAXIMUM USEFUL LOAD:		780 LBS 680
BAGGAGE ALLOWANCE		200 LBS
WING LOADING: Pounds/Sq Ft		14.7
POWER LOADING: Pounds/HP		13.1
FUEL CAPACITY: Total		52 GAL.
OIL CAPACITY		8 QTS
ENGINE: Teledyne Continental, Fuel Injection 195 BHP at 2600 RPM		IO-360-K
PROPELLER: Constant Speed, Diameter		80 IN.

TABLE OF CONTENTS

pencil indicates 1977 POH As

FAA-H-8083-23

SECTION 1
GENERAL

INTRODUCTION

This supplement, written especially for operators of the Cessna Hawk XP floatplane, provides information not found in the Hawk XP Pilot's Operating Handbook. It contains procedures and data required for safe and efficient operation of the airplane equipped with Edo Model 248B-2440 floats.

Information contained in the Pilot's Operating Handbook for the Hawk XP, which is the same as that for the floatplane, is generally not repeated in this supplement.

DESCRIPTIVE DATA

PROPELLER

Propeller Manufacturer: McCauley Accessory Division.
Propeller Model Number: 2A34C203/90DCA-10.
Number of Blades: 2.
Propeller Diameter, Maximum: 80 inches.
Minimum: 78.5 inches.
Propeller Type: Constant speed and hydraulically actuated, with a low pitch setting of 11.3° and high pitch setting of 24.8° (30 inch station).

MAXIMUM CERTIFICATED WEIGHT

Takeoff: 2550 lbs.
Landing: 2550 lbs.
Weight in Baggage Compartment:
Baggage Area 1 - Station 82 to 108: 200 lbs. See note below.
Baggage Area 2 - Station 108 to 142: 50 lbs. See note below.

NOTE

The maximum combined weight capacity for baggage areas 1 and 2 is 200 lbs.

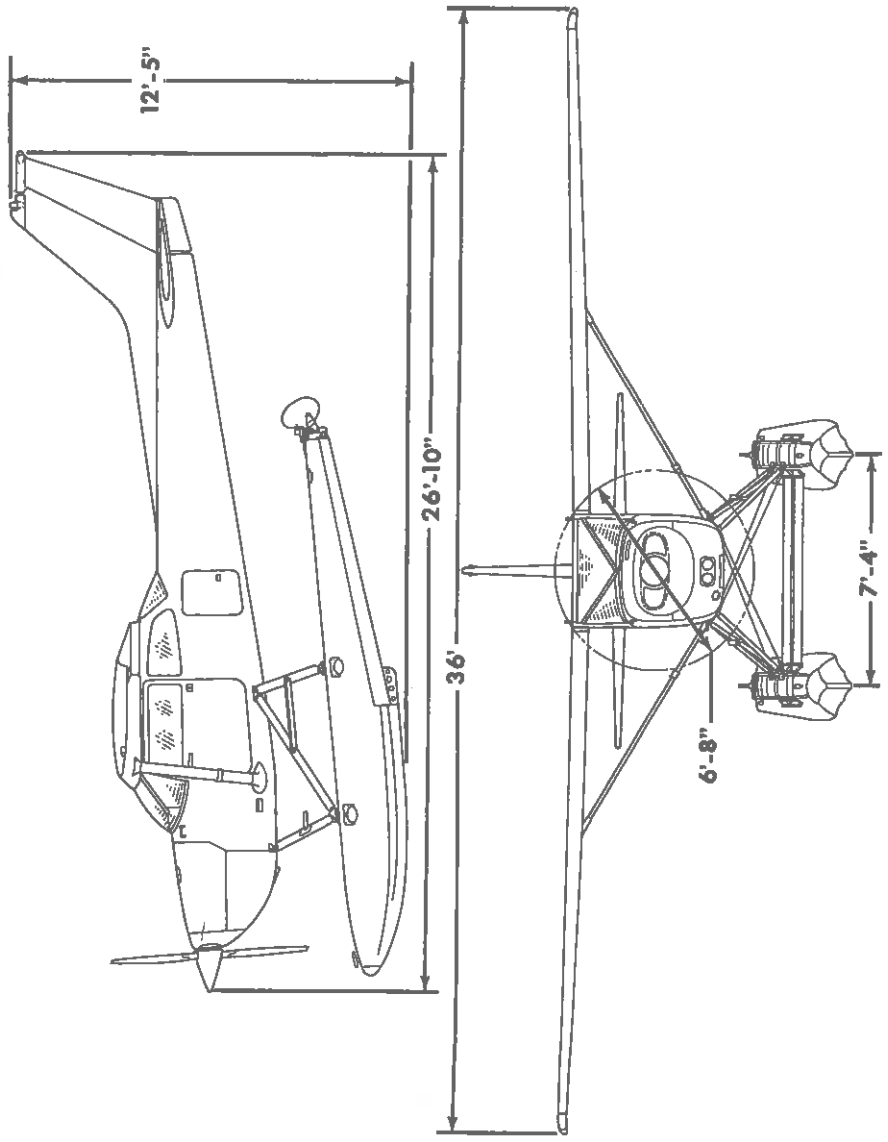


Figure 1-1. Three View (Sheet 1 of 2)

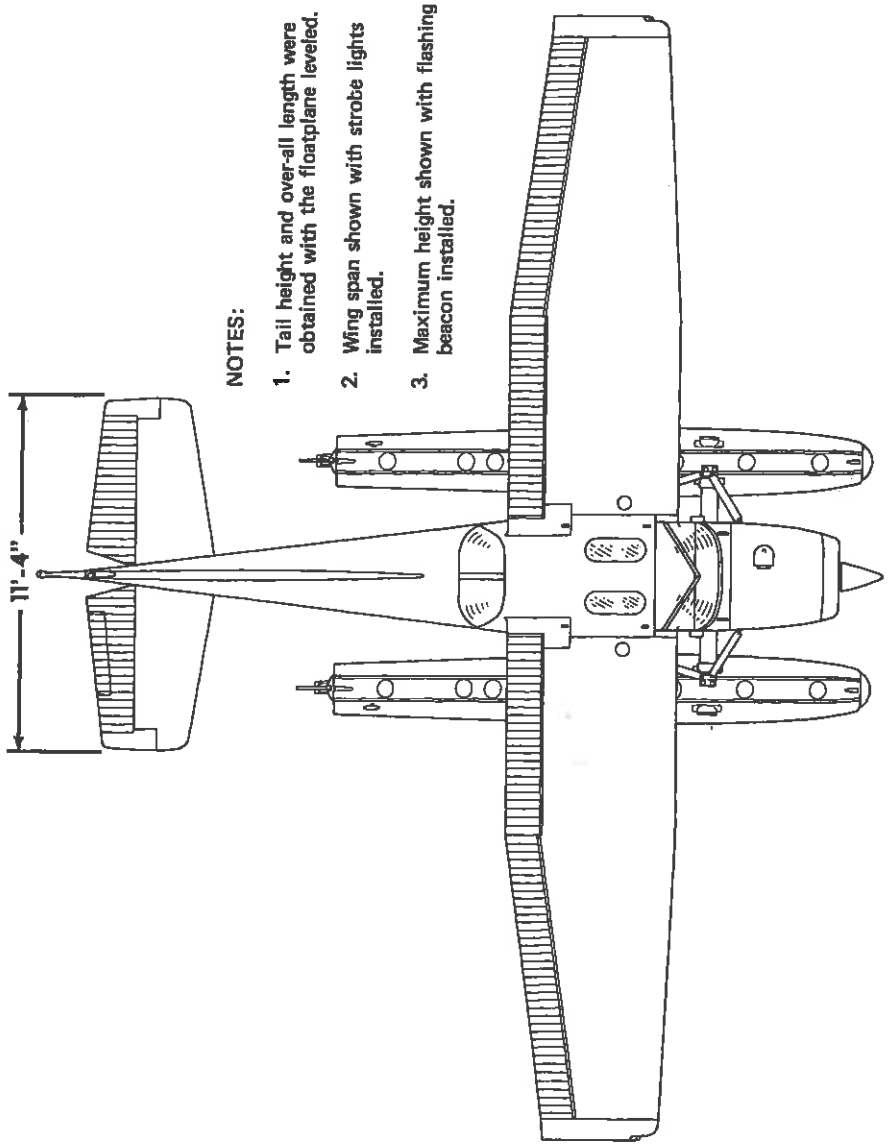


Figure 1-1. Three View (Sheet 2 of 2)

STANDARD AIRPLANE WEIGHTS

Standard Empty Weight: 1770 lbs. 1796 lbs
Maximum Useful Load: 780 lbs. 754 lbs

SPECIFIC LOADINGS

Wing Loading: 14.7 lbs./sq. ft.
Power Loading: 13.1 lbs./hp.

SECTION 2
LIMITATIONS

INTRODUCTION

Except as shown in this section, the floatplane operating limitations are the same as those for the Hawk XP landplane.

AIRSPEED LIMITATIONS

Airspeed limitations and their operational significance are shown in figure 2-1.

	SPEED	KCAS	KIAS	REMARKS
V_{NE}	Never Exceed Speed	161	163	Do not exceed this speed in any operation.
V_{NO}	Maximum Structural Cruising Speed	127	129	Do not exceed this speed except in smooth air, and then only with caution.
V_A	Maneuvering Speed: 2550 Pounds 2300 Pounds 2050 Pounds	 103 97 91	 105 99 93	Do not make full or abrupt control movements above this speed.
V_{FE}	Maximum Flap Extended Speed	87	85	Do not exceed this speed with flaps down.

Figure 2-1. Airspeed Limitations

AIRSPEED INDICATOR MARKINGS

Airspeed indicator markings are the same as those shown in the Hawk XP Pilot's Operating Handbook. Due to minor differences in airspeed system calibration and stall speeds with floats installed, the indicated stall speeds as shown in Section 5 of this supplement are slightly lower than reflected by the airspeed indicator markings.

POWER PLANT LIMITATIONS

Propeller Manufacturer: McCauley Accessory Division.
Propeller Model Number: 2A34C203/90DCA-10.
Propeller Diameter, Maximum: 80 inches.
Minimum: 78.5 inches.
Propeller Blade Angle at 30 Inch Station, Low: 11.3°.
High: 24.8°.

WEIGHT LIMITS

Maximum Takeoff Weight: 2550 lbs.
Maximum Landing Weight: 2550 lbs.
Maximum Weight in Baggage Compartment:
Baggage Area 1 - Station 82 to 108: 200 lbs. See note below.
Baggage Area 2 - Station 108 to 142: 50 lbs. See note below.

NOTE

The maximum combined weight capacity for baggage areas 1 and 2 is 200 lbs.

CENTER OF GRAVITY LIMITS

Center of Gravity Range:
Forward: 37.0 inches aft of datum at 2100 lbs. or less, with straight line variation to 39.5 inches aft of datum at 2550 lbs.
Aft: 45.5 inches aft of datum at all weights.
Reference Datum: Lower portion of front face of firewall.

MANEUVER LIMITS

The floatplane is certificated in the normal category. The normal category is applicable to aircraft intended for non-aerobatic operations. These include any maneuvers incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles, and steep turns in which the angle of bank is not more than 60°. Aerobatic maneuvers, including spins, are not approved.

PLACARDS

The following information is displayed in the form of composite or individual placards in addition to those specified in the Hawk XP Pilot's Operating Handbook.

1. In full view of the pilot: (The "DAY-NIGHT-VFR-IFR" entry, shown on the example below, will vary as the airplane is equipped.)

FLOATPLANE

This airplane must be operated as a normal category airplane in compliance with the operating limitations as stated in the form of placards, markings, and manuals.

MAXIMUMS

MANEUVERING SPEED (IAS)	105 knots	
GROSS WEIGHT	2550 lbs.	
FLIGHT LOAD FACTOR	Flaps Up	+3.8, -1.52
	Flaps Down	+2.0

No acrobatic maneuvers, including spins approved. Altitude loss in a stall recovery-250 ft. Flight into known icing conditions prohibited. This airplane is certified for the following flight operations as of date of original airworthiness certificate:

DAY-NIGHT-VFR-IFR

2. Adjacent to the airspeed indicator:

FLOATPLANE STALL SPEEDS ARE APPROX. 5 KIAS LOWER THAN INDICATOR MARKINGS.

3. Near water rudder stowage hook:

WATER RUDDER ALWAYS UP EXCEPT WATER TAXIING

4. On the water rudder retraction handle:

WATER RUDDERS PULL TO RETRACT

SECTION 3
EMERGENCY PROCEDURES

INTRODUCTION

Checklist and amplified procedures contained in the Hawk XP Pilot's Operating Handbook generally should be followed. The additional or changed procedures specifically required for operation of the floatplane are presented in this section.

AIRSPEEDS FOR EMERGENCY OPERATION

The speeds listed below should be substituted, as appropriate, for the speeds contained in Section 3 of the basic handbook.

Engine Failure After Takeoff:	
Wing Flaps Up	65 KIAS
Wing Flaps Down 20°	60 KIAS
Maneuvering Speed:	
2550 Lbs	105 KIAS
2300 Lbs	99 KIAS
2050 Lbs	93 KIAS
Maximum Glide:	
2550 Lbs	70 KIAS
2300 Lbs	66 KIAS
2050 Lbs	63 KIAS
Precautionary Landing With Engine Power, Flaps Down	60 KIAS
Landing Without Engine Power:	
Wing Flaps Up	70 KIAS
Wing Flaps Down	60 KIAS

OPERATIONAL CHECKLISTS

ENGINE FAILURE

ENGINE FAILURE DURING TAKEOFF RUN

1. Throttle -- IDLE.
2. Control Wheel -- FULL AFT.
3. Mixture -- IDLE CUT-OFF.
4. Ignition Switch -- OFF.
5. Master Switch -- OFF.

FORCED LANDINGS

EMERGENCY LANDING ON WATER WITHOUT ENGINE POWER

1. Airspeed -- 70 KIAS (flaps UP).
   60 KIAS (flaps DOWN).
2. Mixture -- IDLE CUT-OFF.
3. Fuel Shutoff Valve -- OFF.
4. Ignition Switch -- OFF.
5. Water Rudders -- UP.
6. Wing Flaps -- AS REQUIRED.
7. Master Switch -- OFF.
8. Doors -- UNLATCH PRIOR TO APPROACH.
9. Touchdown -- SLIGHTLY TAIL LOW.
10. Control Wheel -- HOLD FULL AFT as floatplane decelerates.

EMERGENCY LANDING ON LAND WITHOUT ENGINE POWER

1. Airspeed -- 70 KIAS (flaps UP).
   60 KIAS (flaps DOWN).
2. Mixture -- IDLE CUT-OFF.
3. Fuel Shutoff Valve -- OFF.
4. Ignition Switch -- OFF.
5. Water Rudders -- UP.
6. Wings Flaps -- AS REQUIRED (40° recommended).
7. Master Switch -- OFF.
8. Doors -- UNLATCH PRIOR TO APPROACH.
9. Touchdown -- LEVEL ATTITUDE.
10. Control Wheel -- FULL AFT (after contact).

AMPLIFIED PROCEDURES

MAXIMUM GLIDE

After an engine failure in flight, the best glide speed as shown in figure 3-1 should be established as quickly as possible.

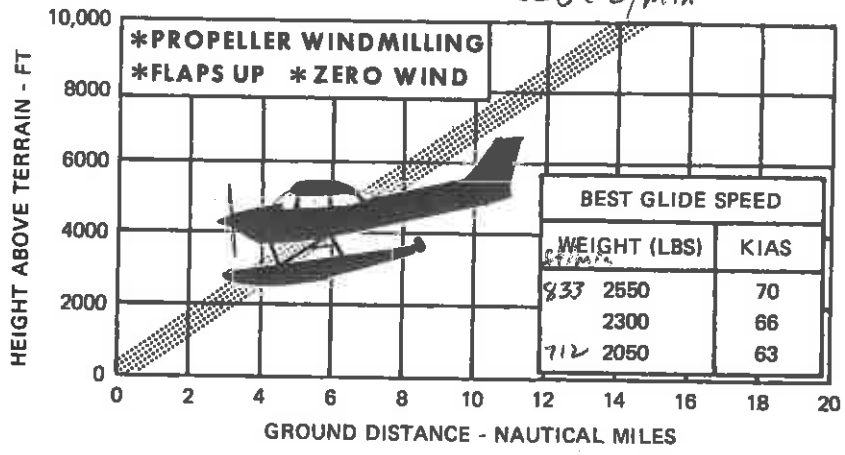


Figure 3-1. Maximum Glide

SECTION 4
NORMAL PROCEDURES

INTRODUCTION

Checklist and amplified procedures contained in the Hawk XP Pilot's Operating Handbook generally should be followed. The additional or changed procedures specifically required for operation of the floatplane are presented in this section.

SPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 2550 pounds and may be used for any lesser weight.

Takeoff:	
Normal Climb Out	60-70 KIAS
Maximum Performance, Flaps 20°, Speed at 50 Feet	56 KIAS
Enroute Climb, Flaps Up:	
Normal	80-90 KIAS
Best Rate of Climb, Sea Level	72 KIAS
Best Rate of Climb, 10,000 Feet	66 KIAS
Best Angle of Climb, Sea Level	56 KIAS
Best Angle of Climb, 10,000 Feet	60 KIAS
Landing Approach:	
Normal Approach, Flaps Up	65-75 KIAS
Normal Approach, Flaps 40°	55-65 KIAS
Maximum Performance Approach, Flaps 40°	60 KIAS
Balked Landing:	
Maximum Power, Flaps 20°	55 KIAS
Maximum Recommended Turbulent Air Penetration Speed:	
2550 Lbs	105 KIAS
2300 Lbs	99 KIAS
2050 Lbs	93 KIAS
Maximum Demonstrated Crosswind Velocity:	
Takeoff or Landing	13 KNOTS

CHECKLIST PROCEDURES

PREFLIGHT INSPECTION

1. Floats and Struts -- INSPECT for dents, cracks, scratches, etc.
2. Float Compartments -- INSPECT for water accumulation.

NOTE

Remove rubber balls which serve as stoppers on the standpipe in each float compartment and pump out any accumulation of water. Reinstall rubber balls with enough pressure for a snug fit.

3. Water Rudders -- CHECK freedom of movement and security.

BEFORE STARTING ENGINE

1. Water Rudder Operation -- CHECK VISUALLY.
2. Water Rudders -- DOWN for taxiing (retraction handle removed from stowage hook).

TAKEOFF

1. Water Rudders -- UP (retraction handle secured on stowage hook).
2. Wing Flaps -- 0°- 20° (20° preferred).
3. Cowl Flap -- OPEN.
4. Control Wheel -- HOLD FULL AFT.
5. Power -- FULL THROTTLE and 2600 RPM (advance slowly).
6. Mixture -- LEAN FOR LAKE ELEVATION.
7. Control Wheel -- MOVE FORWARD when the nose stops rising to attain planing attitude (on the step).
8. Airspeed -- 45-50 KIAS.
9. Control Wheel -- APPLY LIGHT BACK PRESSURE to lift off.

NOTE

To reduce takeoff water run, the technique of raising one float out of the water may be used. This procedure is described in the amplified procedures in this section.

10. Climb Speed -- 55-65 KIAS (flaps 20°).
    60-70 KIAS (flaps UP).

With obstacles ahead, climb at 56 KIAS (flaps 20°).

11. Wing Flaps -- UP after all obstacles are cleared.

ENROUTE CLIMB

NORMAL CLIMB

1. Airspeed -- 80-90 KIAS.

MAXIMUM PERFORMANCE CLIMB

1. Airspeed -- 72 KIAS (sea level) to 66 KIAS (10,000 feet).

BEFORE LANDING

1. Water Rudders -- UP.
2. Wing Flaps -- AS DESIRED.
3. Airspeed -- 65-75 KIAS (flaps UP).
   55-65 KIAS (flaps DOWN).

LANDING

1. Touchdown -- SLIGHTLY TAIL LOW.
2. Control Wheel -- HOLD FULL AFT as floatplane decelerates to taxi speed.

NOTE

With forward loadings, a slight nose-down pitch may occur if the elevator is not held full up as floatplane comes down off step.

AFTER LANDING

1. Water Rudders -- DOWN.

SECURING AIRPLANE

1. Fuel Selector Valve -- LEFT TANK or RIGHT TANK to prevent cross-feeding and ensure maximum fuel capacity when refueling.

AMPLIFIED PROCEDURES

TAXIING

Taxi with water rudders down. It is best to limit the engine speed to 80(RPM for normal taxi because water piles up in front of the float bow a higher engine speeds. Taxiing with higher engine RPM may result ir engine overheating and will not appreciably increase the taxi speed. Ir addition, it may lead to water spray striking the propeller tips, causing propeller tip erosion.

During all low speed taxi operations, the elevator should be positioned to keep the float bows out of the water as far as possible. Normally this requires holding the control wheel full aft.

For minimum taxi speed in close quarters, use idle RPM and a single magneto. This procedure is recommended for short periods of time only.

Although taxiing is very simple with the water rudders, it is sometimes necessary to "sail" the floatplane under high wind conditions. In addition to the normal flight controls, the wing flaps and cabin doors will aid in "sailing". Water rudders should be retracted during "sailing".

Rudder trim may be used to reduce rudder pedal forces while taxiing in crosswinds or for extended sailing in one direction.

To taxi great distances, it may be advisable to taxi on the step with the water rudders retracted. Turns on the step from an upwind heading may be made with safety providing they are not too sharp and if ailerons are used to counteract any overturning tendency.

TAKEOFF

Start the takeoff by applying full throttle smoothly while holding the control wheel full aft. When the nose stops rising, move the control wheel forward slowly to place the floatplane on the step. Slow control movement and light control pressures produce the best results. Attempts to force the floatplane into the planing attitude will generally result in loss of speed and delay in getting on the step. The floatplane will assume a planing attitude which permits acceleration to takeoff speed, at which time the floatplane will fly off smoothly.

The use of 20° wing flaps throughout the takeoff run is recommended.

Upon reaching a safe altitude and airspeed, retract the wing flaps slowly, especially when flying over glassy water because a loss of altitude is not very apparent over such a surface.

If porpoising is encountered while on the step, apply additional control wheel back pressure to correct the excessively nose-low attitude. If this does not correct the porpoising, immediately reduce power to idle and allow the floatplane to slow to taxi speed, at which time the takeoff can again be initiated.

MAXIMUM PERFORMANCE TAKEOFF

To clear an obstacle after takeoff with 20° wing flaps, use an obstacle clearance speed of 56 KIAS for maximum performance. Takeoff distances are shown in Section 5 for this technique, and on water conditions that are smooth but non-glassy. Under some adverse combinations of takeoff weight, pressure altitude, and air temperature, operation on glassy water may require significantly longer takeoff distances to accelerate to the liftoff speed, and allowance should be made for this.

If lift off is difficult due to high lake elevation or glassy water, the following procedure is recommended: With the floatplane in the planing attitude, apply full aileron to raise one float out of the water. When one float leaves the water, apply slight elevator back pressure to complete the takeoff. Care must be taken to stop the rising wing as soon as the float is clear of the water, and in crosswinds, raise only the downwind wing. With one float out of the water, the floatplane accelerates to takeoff speed almost instantaneously.

CROSSWIND TAKEOFF

For a crosswind takeoff, start the takeoff run with wing flaps up and water rudders extended for better directional control. Flaps should be extended to 20° and the water rudders retracted when the floatplane is on the step; the remainder of the takeoff is normal. If the floats are lifted from the water one at a time, the downwind float should be lifted first.

ENROUTE CLIMB

When conducting the following climbs, the mixture should be leaned as shown by the fuel flow placard, located on the instrument panel.

NORMAL CLIMB

Normal climbs are conducted at 80-90 KIAS with flaps up, full throttle, and 2600 RPM.

BEST RATE OF CLIMB

The best rate-of-climb speeds range from 72 KIAS at sea level to 66 KIAS at 10,000 feet with flaps up, full throttle, and 2600 RPM.

BEST ANGLE OF CLIMB

If an obstruction ahead requires a steep climb angle, a best angle-of-climb speed should be used with flaps up and maximum power. This speed is 56 KIAS at sea level, increasing to 60 KIAS at 10,000 feet. Climbs at speeds lower than the best rate-of-climb speed should be of short duration to improve engine cooling.

CRUISE

Cruise power settings and corresponding fuel consumption are shown on the Cruise Performance charts, figure 5-7 in this supplement. Range and endurance information is shown in figures 5-8 and 5-9 in this supplement.

LANDING

Normal landings can be made power on or power off using approach speeds of 65-75 KIAS with flaps up and 55-65 KIAS with flaps down.

GLASSY WATER LANDING

With glassy water conditions, flaps should be extended to 20° and enough power used to maintain a low rate of descent (approximately 200 feet per minute). The floatplane should be flown onto the water at this sink rate with no flare attempted since height above glassy water is nearly impossible to judge. Power should be reduced to idle and control wheel back pressure increased upon contacting the surface. As the floatplane decelerates off the step, apply full back pressure on the control wheel. If this glassy water technique is used in conjunction with an obstacle clearance approach, allowance should be made for appreciably longer total distances than are shown in Section 5 to clear a 50-foot obstacle.

CROSSWIND LANDING

The wing-low slip method should be used with the upwind float contacting the surface first.

SECTION 5
PERFORMANCE

INTRODUCTION

The information presented in the Introduction, Use of Performance Charts, and Sample Problem paragraphs in Section 5 of the Hawk XP Pilot's Operating Handbook is applicable to the floatplane. Using this information, and the performance charts in this supplement, complete flight planning may be accomplished.

Cruise performance data in this supplement is based on a standard day temperature as shown on the charts. The effect of temperature variations from standard can be determined by using the applicable cruise charts in the basic handbook for the landplane.

AIRSPEED CALIBRATION

NORMAL STATIC SOURCE

FLAPS UP											
KIAS	40	50	60	70	80	90	100	110	120	130	140
KCAS	47	54	62	70	79	88	98	108	118	128	138
FLAPS 20°											
KIAS	40	50	60	70	80	85	---	---	---	---	---
KCAS	48	55	63	71	81	86	---	---	---	---	---
FLAPS 40°											
KIAS	40	50	60	70	80	85	---	---	---	---	---
KCAS	47	54	63	72	82	87	---	---	---	---	---

Figure 5-1. Airspeed Calibration

TEMPERATURE CONVERSION CHART

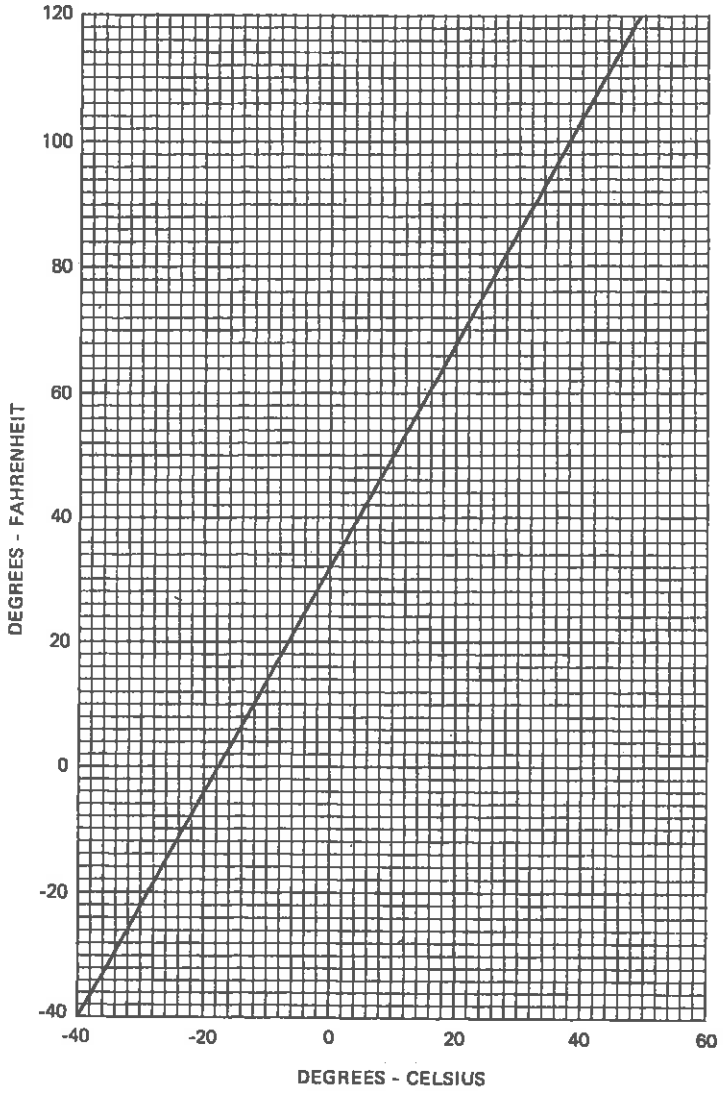


Figure 5-2. Temperature Conversion Chart

STALL SPEEDS

$V_{REF} = 1.3 V_{SO}$

CONDITIONS:
Power Off

NOTES:
1. Altitude loss during a stall recovery may be as much as 250 feet.
2. KIAS values are approximate.

MOST REARWARD CENTER OF GRAVITY

WEIGHT LBS	FLAP DEFLECTION	ANGLE OF BANK							
		0°		30°		45°		60°	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
2550	V_{S1} UP	44	50	47	54	52	59	62	71
	20°	36	45	38	48	43	54	51	64
	V_{SO} 40°	35	44	37	47	42	52	50	62

MOST FORWARD CENTER OF GRAVITY

WEIGHT LBS	FLAP DEFLECTION	ANGLE OF BANK							
		0°		30°		45°		60°	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
2550	V_{S1} UP	48	53	52	57	57	63	68	75
	20°	43	50	46	54	51	59	61	71
	V_{SO} 40°	42	48	45	52	50	57	59	68

Figure 5-3. Stall Speeds

V_{S1}	46	50	55	64
V_{SO}	39	41	46	55

TAKEOFF DISTANCE

MAXIMUM PERFORMANCE

CONDITIONS:
Flaps 20°
2600 RPM and Full Throttle
Mixture Set at Placard Fuel Flow
Cowl Flap Open
Zero Wind

MIXTURE SETTING	
PRESS ALT	GPH
S.L.	16
2000	15
4000	14

NOTE:
Decrease distances 10% for each 9 knots headwind.

WEIGHT LBS	TAKEOFF SPEED KIAS		PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
	LIFT OFF	AT 50 FT		WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS
2550	49	56	S.L.	975	1615	1080	1765	1195	1940	1325	2130	1470	2345
			1000	1105	1815	1230	1995	1365	2195	1520	2420	1700	2680
			2000	1265	2050	1405	2265	1570	2505	2760	2775	1975	3095
			3000	1450	2335	1625	2590	1825	2880	2055	3215	2325	3605
			4000	1680	2680	1895	2990	2140	3345	2430	3765	2775	4260

Figure 5-4. Takeoff Distance

RATE OF CLIMB

MAXIMUM

CONDITIONS:
Flaps Up
2600 RPM
Full Throttle
Mixture Set at Placard Fuel Flow
Cowl Flap Open

MIXTURE SETTING	
PRESS ALT	GPH
S.L.	16
2000	15
4000	14
6000	13
8000	12
10,000	11

WEIGHT LBS	PRESS ALT FT	CLIMB SPEED KIAS	RATE OF CLIMB - FPM		
			0°C	20°C	40°C
2550	S.L.	72	940	845	750
	2000	71	820	730	635
	4000	69	700	615	525
	6000	68	585	500	415
	8000	67	465	385	---
	10,000	66	350	275	---

Figure 5-5. Rate of Climb

TIME, FUEL, AND DISTANCE TO CLIMB

MAXIMUM RATE OF CLIMB

CONDITIONS:
Flaps Up
2600 RPM
Full Throttle
Mixture Set at Placard Fuel Flow
Cowl Flap Open
Standard Temperature

MIXTURE SETTING	
PRESS ALT	GPH
S.L.	16
2000	15
4000	14
6000	13
8000	12
10,000	11

NOTES:
1. Add 1.4 gallons of fuel for engine start, taxi and takeoff allowance.
2. Increase time, fuel and distance by 10% for each 10°C above standard temperature.
3. Distances shown are based on zero wind.

WEIGHT LBS	PRESSURE ALTITUDE FT	TEMP °C	CLIMB SPEED KIAS	RATE OF CLIMB FPM	FROM SEA LEVEL		
					TIME MIN	FUEL USED GALLONS	DISTANCE NM
2550	S.L.	15	72	870	0	0	0
	1000	13	71	820	1	0.3	1
	2000	11	71	770	2	0.6	3
	3000	9	70	720	4	1.0	5
	4000	7	69	670	5	1.3	6
	5000	5	69	620	7	1.7	8
	6000	3	68	570	9	2.0	11
	7000	1	68	520	10	2.4	13
	8000	-1	67	470	12	2.9	15
	9000	-3	66	420	15	3.3	18
	10,000	-5	66	370	17	3.8	22

Figure 5-6. Time, Fuel, and Distance to Climb (Sheet 1 of 2)

TIME, FUEL, AND DISTANCE TO CLIMB

NORMAL CLIMB - 85 KIAS

CONDITIONS:
Flaps Up
2600 RPM
Full Throttle
Mixture Set at Placard Fuel Flow
Cowl Flap Open
Standard Temperature

MIXTURE SETTING	
PRESS ALT	GPH
S.L.	16
2000	15
4000	14
6000	13
8000	12
10,000	11

NOTES:
1. Add 1.4 gallons of fuel for engine start, taxi and takeoff allowance.
2. Increase time, fuel and distance by 10% for each 8°C above standard temperature.
3. Distances shown are based on zero wind.

WEIGHT LBS	PRESSURE ALTITUDE FT	TEMP °C	RATE OF CLIMB FPM	FROM SEA LEVEL		
				TIME MIN	FUEL USED GALLONS	DISTANCE NM
2550	S.L.	15	810	0	0	0
	1000	13	755	1	0.3	2
	2000	11	700	3	0.7	4
	3000	9	650	4	1.1	6
	4000	7	595	6	1.4	8
	5000	5	540	8	1.9	11
	6000	3	485	10	2.3	14
	7000	1	430	12	2.8	17
	8000	-1	375	14	3.3	21
	9000	-3	325	17	3.8	26
	10,000	-5	270	21	4.5	32

Figure 5-6. Time, Fuel, and Distance to Climb (Sheet 2 of 2)

CRUISE PERFORMANCE

PRESSURE ALTITUDE 2000 FEET

CONDITIONS:
2550 Pounds
Recommended Lean Mixture
Cowl Flap Closed

NOTE

For best fuel economy at 70% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

		STANDARD TEMPERATURE 11°C		
RPM	MP	% BHP	KTAS	GPH
2600	24	81	114	11.4
	23	76	110	10.7
	22	71	106	10.0
	21	65	102	9.3
2500	25	81	114	11.5
	24	77	111	10.8
	23	72	107	10.2
	22	67	103	9.5
2400	25	76	110	10.8
	24	72	107	10.2
	23	67	103	9.5
	22	63	100	8.9
2300	25	72	107	10.1
	24	67	103	9.5
	23	63	100	8.9
	22	59	96	8.4
2200	25	67	103	9.4
	24	63	99	8.9
	23	59	95	8.3
	22	55	91	7.8
	21	51	87	7.3
	20	47	83	6.8
	19	43	77	6.3

Figure 5-7. Cruise Performance (Sheet 1 of 5)

CRUISE PERFORMANCE

PRESSURE ALTITUDE 4000 FEET

CONDITIONS:
2550 Pounds
Recommended Lean Mixture
Cowl Flap Closed

NOTE

For best fuel economy at 70% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

		STANDARD TEMPERATURE 7°C		
RPM	MP	% BHP	KTAS	GPH
2600	23	79	114	11.1
	22	73	110	10.4
	21	68	106	9.7
	20	63	101	9.0
2500	24	79	114	11.2
	23	75	111	10.6
	22	70	107	9.9
	21	65	103	9.3
2400	24	74	111	10.5
	23	70	107	9.9
	22	65	103	9.2
	21	61	99	8.6
2300	24	70	107	9.9
	23	65	103	9.3
	22	61	99	8.7
	21	57	95	8.1
2200	24	65	103	9.2
	23	61	99	8.7
	22	57	95	8.1
	21	53	91	7.6
	20	49	86	7.1
	19	45	80	6.6

Figure 5-7. Cruise Performance (Sheet 2 of 5)

CRUISE PERFORMANCE

PRESSURE ALTITUDE 6000 FEET

CONDITIONS:
2550 Pounds
Recommended Lean Mixture
Cowl Flap Closed

NOTE

For best fuel economy at 70% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

		STANDARD TEMPERATURE 3°C		
RPM	MP	% BHP	KTAS	GPH
2600	23	81	117	11.5
	22	76	114	10.8
	21	71	110	10.1
	20	66	105	9.3
2500	23	77	114	10.9
	22	73	111	10.3
	21	68	107	9.6
	20	63	103	9.0
2400	23	72	110	10.2
	22	68	107	9.6
	21	63	102	9.0
	20	59	98	8.4
2300	23	68	107	9.6
	22	64	103	9.0
	21	59	98	8.4
	20	55	94	7.9
2200	23	63	103	9.0
	22	59	98	8.4
	21	55	94	7.9
	20	51	90	7.4
	19	47	84	6.8
	18	43	78	6.4

Figure 5-7. Cruise Performance (Sheet 3 of 5)

CRUISE PERFORMANCE

PRESSURE ALTITUDE 8000 FEET

CONDITIONS:
2550 Pounds
Recommended Lean Mixture
Cowl Flap Closed

NOTE

For best fuel economy at 70% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

		STANDARD TEMPERATURE -1°C		
RPM	MP	% BHP	KTAS	GPH
2600	21	74	114	10.5
	20	69	109	9.8
	19	64	104	9.0
	18	59	99	8.3
2500	21	71	111	10.0
	20	66	107	9.4
	19	61	102	8.7
	18	56	97	8.1
2400	21	65	106	9.3
	20	61	101	8.6
	19	56	97	8.0
	18	52	91	7.5
2300	21	62	102	8.7
	20	57	98	8.2
	19	53	93	7.6
	18	48	87	7.0
2200	21	57	98	8.2
	20	53	93	7.7
	19	49	88	7.1
	18	45	81	6.6

Figure 5-7. Cruise Performance (Sheet 4 of 5)

CRUISE PERFORMANCE

PRESSURE ALTITUDE 10,000 FEET

CONDITIONS:
2550 Pounds
Recommended Lean Mixture
Cowl Flap Closed

NOTE

For best fuel economy at 70% power or less, operate at 1 GPH leaner than shown in this chart or at peak EGT if an EGT indicator is installed.

		STANDARD TEMPERATURE -5°C		
RPM	MP	% BHP	KTAS	GPH
2600	19	67	108	9.4
	18	61	103	8.7
	17	56	97	8.0
	16	51	90	7.3
2500	19	64	106	9.1
	18	59	101	8.4
	17	54	95	7.8
	16	49	87	7.1
2400	19	59	100	8.3
	18	54	95	7.8
	17	49	89	7.2
	16	45	82	6.6
2300	19	55	96	7.9
	18	51	91	7.3
	17	46	84	6.8
2200	19	51	91	7.4
	18	47	85	6.9
	17	43	78	6.4

Figure 5-7. Cruise Performance (Sheet 5 of 5)

RANGE PROFILE

45 MINUTES RESERVE
49 GALLONS USABLE FUEL

CONDITIONS:
2550 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature
Zero Wind

NOTES:
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the distance during a normal climb as shown in figure 5-6 of this supplement.
2. Reserve fuel is based on 45 minutes at 45% BHP and is 5.0 gallons.

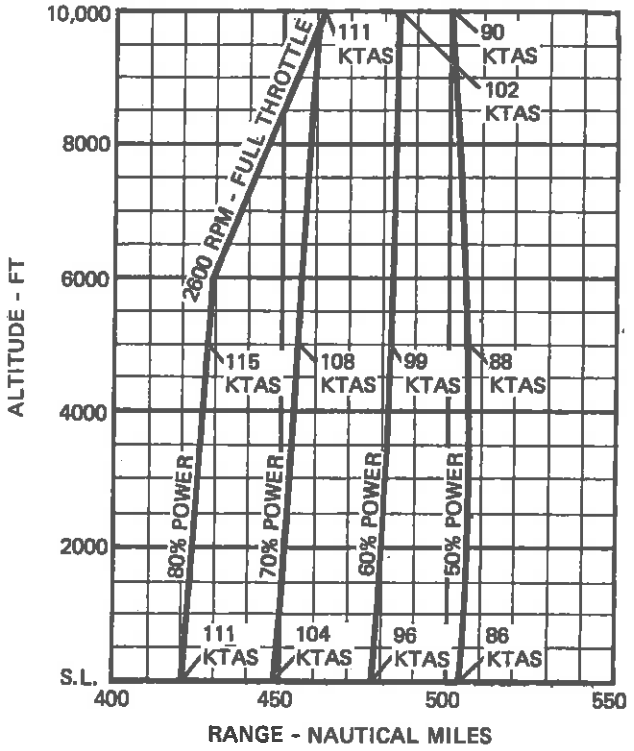


Figure 5-8. Range Profile

ENDURANCE PROFILE
45 MINUTES RESERVE
49 GALLONS USABLE FUEL

CONDITIONS:
2550 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature

NOTES:
1. This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during a normal climb as shown in figure 5-6 of this supplement.
2. Reserve fuel is based on 45 minutes at 45% BHP and if 5.0 gallons.

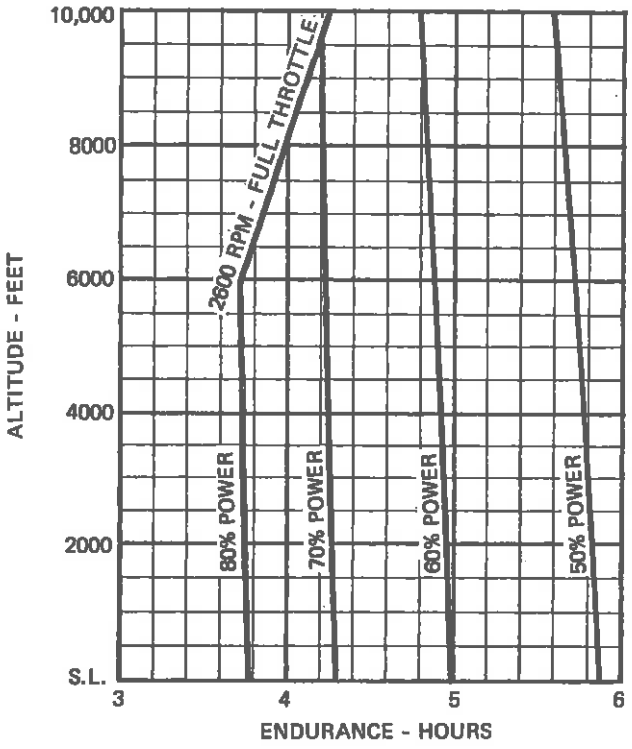


Figure 5-9. Endurance Profile

LANDING DISTANCE
MAXIMUM PERFORMANCE

CONDITIONS:
Flaps 40°
Power Off
Zero Wind

NOTES:
1. Refer to Section 4 for recommended technique if water surface is glassy.
2. Decrease distances 10% for each 9 knots headwind.

WEIGHT LBS	SPEED AT 50 FT KIAS	PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
			WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS
2550	60	S.L.	625	1275	650	1310	670	1340	695	1375	715	1410
		1000	650	1310	670	1340	695	1380	720	1415	745	1450
		2000	675	1345	700	1385[b]	720	[c]1415	745	1455	770	1490
		3000	700	1385	725	1420[a]	750	[c]1460	775	1500	800	1535
		4000	725	1420	750	1460	775	1500	805	1545	830	1580

Figure 5-10. Landing Distance

SECTION 6
WEIGHT & BALANCE

INTRODUCTION

The following information will enable you to operate your floatplane within the prescribed weight and center of gravity limitations. To figure weight and balance, use the Sample Loading Problem, Loading Graph, Center of Gravity Moment Envelope, and Center of Gravity Limits as described in this supplement. Also, reference may be made to the Hawk XP Pilot's Operating Handbook for diagrams showing Loading Arrangements and Internal Cabin Dimensions.

WEIGHT AND BALANCE

Take the basic empty weight and moment from appropriate weight and balance records carried in your floatplane, and enter them in the column titled YOUR AIRPLANE on the Sample Loading Problem.

NOTE

In addition to the basic empty weight and moment noted on these records, the C.G. arm (fuselage station) is also shown, but need not be used on the Sample Loading Problem. The moment which is shown must be divided by 1000, and this value used as the moment/1000 on the loading problem.

Use the Loading Graph to determine the moment/1000 for each additional item to be carried; then list these on the loading problem.

NOTE

Loading Graph information for the pilot, passengers, and baggage is based on seats positioned for average occupants and baggage loaded in the center of the areas shown in the Loading Arrangements diagram. For loadings which may differ from these, the Sample Loading Problem lists fuselage stations for these items to indicate their

forward and aft C.G. range limitations (seat travel or baggage area limitations). Additional moment calculations, based on the actual weight and C.G. arm (fuselage station) of the item being loaded, must be made if the position of the load is different from that shown on the Loading Graph.

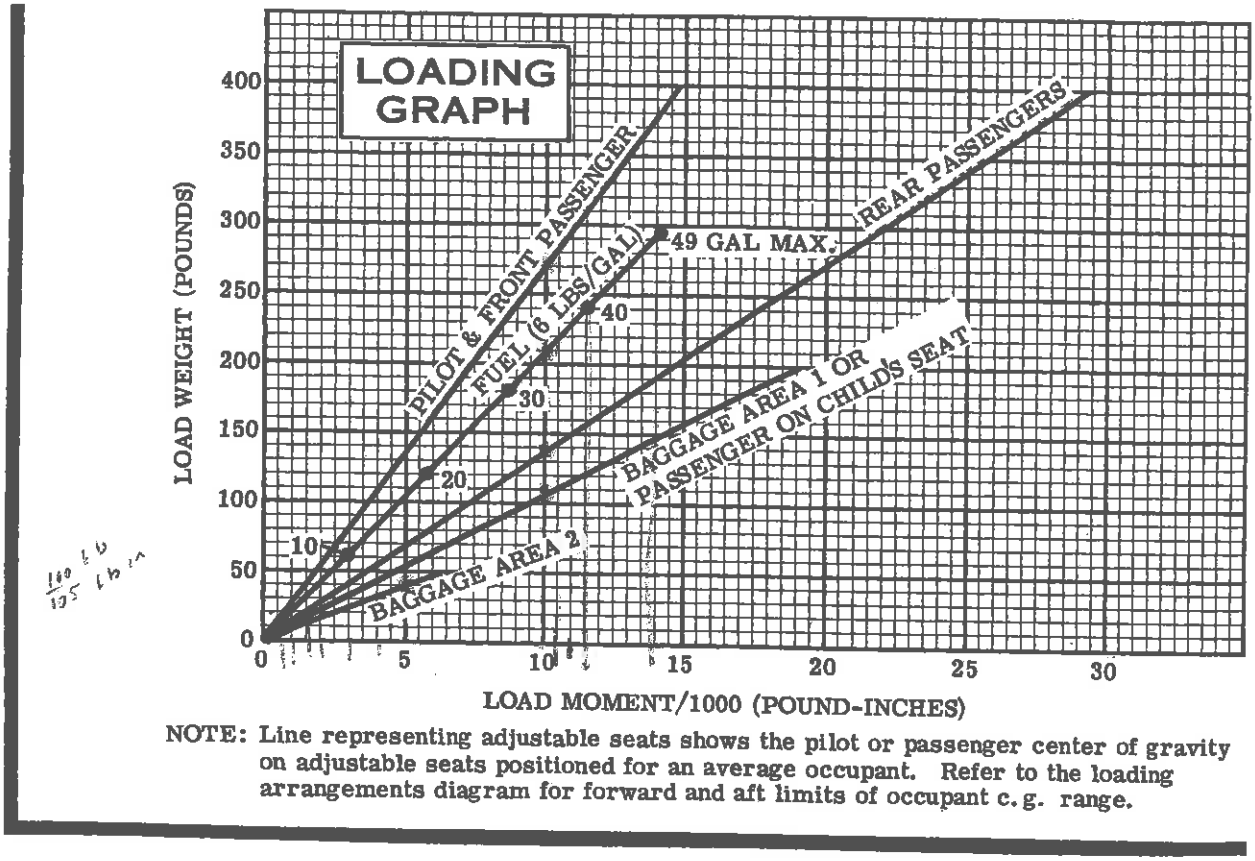
Total the weights and moments/1000 and plot these values on the Center of Gravity Moment Envelope to determine whether the point falls within the envelope, and if the loading is acceptable.

SAMPLE LOADING PROBLEM FLOATPLANE	SAMPLE AIRPLANE		YOUR AIRPLANE	
	Weight (lbs.)	Moment (lb. -ins. /1000)	Weight (lbs.)	Moment (lb. - ins. /1000)
1. Basic Empty Weight (Use the data pertaining to your airplane as it is presently equipped. Includes unusable fuel and full oil)	1802	68.3		
2. Usable Fuel (At 6 Lbs./Gal.) Standard Tanks (49 Gal. Maximum)	210	10.1		
3. Pilot and Front Passenger (Station 34 to 46)	340	12.6		
4. Rear Passengers	170	12.4		
5. *Baggage Area 1 or Passenger on Child's Seat (Station 82 to 108), 200 Lbs. Max)	28	2.7		
6. *Baggage Area 2 (Station 108 to 142, 50 Lbs. Max.)				
7. TOTAL WEIGHT AND MOMENT	2550	106.1		
8. Locate this point (2550 at 106.1) on the Center of Gravity Moment Envelope and since this point falls within the envelope, the loading is acceptable.				

NOTE

*The maximum allowable combined weight capacity for baggage areas 1 and 2 is 200 lbs.

Figure 6-1. Sample Loading Problem



NOTE: Line representing adjustable seats shows the pilot or passenger center of gravity on adjustable seats positioned for an average occupant. Refer to the loading arrangements diagram for forward and aft limits of occupant c.g. range.

Figure 6-2. Loading Graph

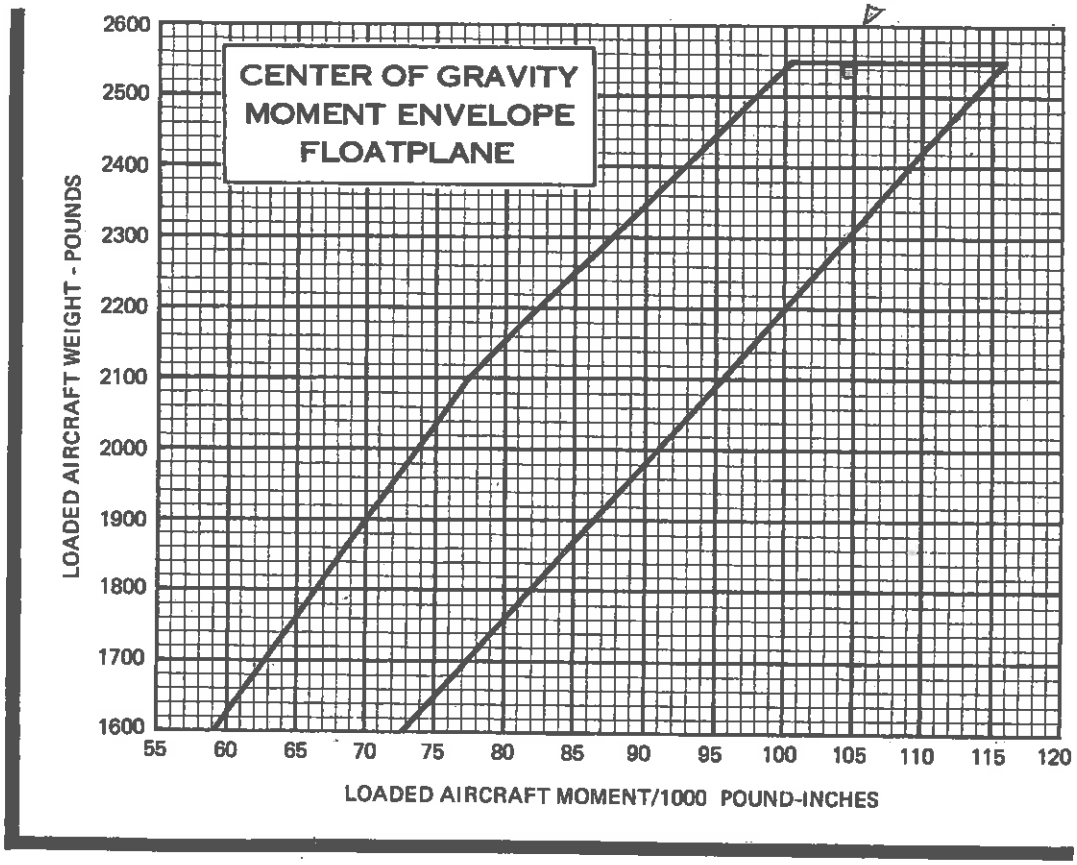


Figure 6-3. Center of Gravity Moment Envelope

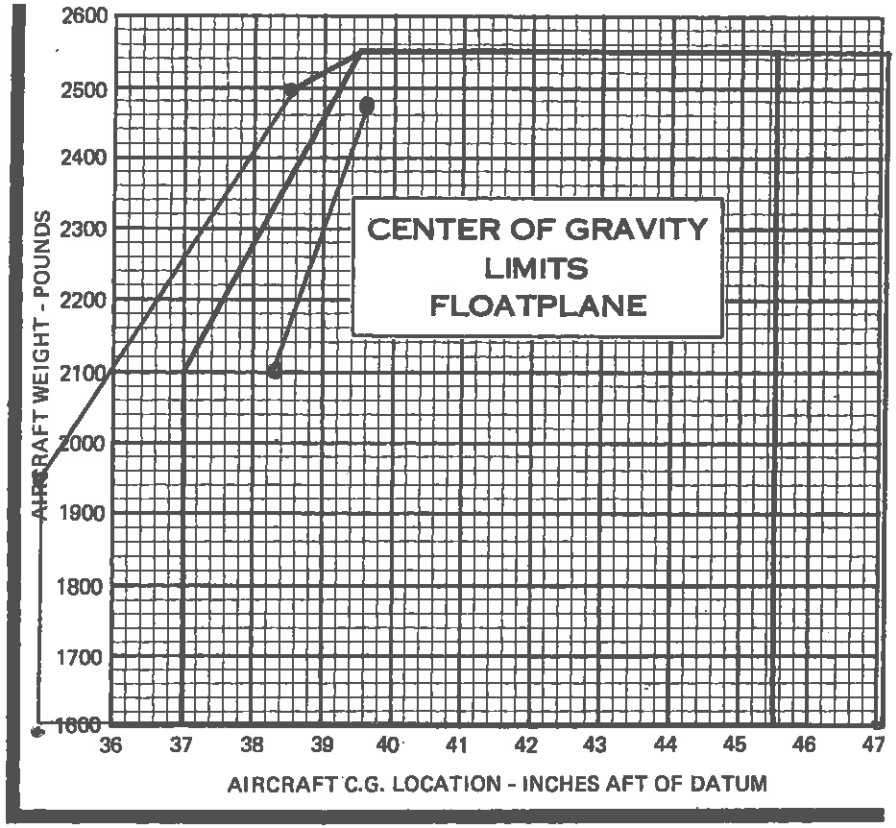


Figure 6-4. Center of Gravity Limits

10/1/2010 - pencil indicates w/ Peekay B2300 on N758LM
Austin + 68 gal 39.5 x 2457
Austin + 45 min fuel 38.3 x 2100

SECTION 7
AIRPLANE & SYSTEMS DESCRIPTIONS

INTRODUCTION

This section contains a description of the modifications and equipment associated with the installation of Edo Model 248B-2440 floats.

THE FLOATPLANE

The floatplane is identical to the landplane with the following exceptions:

1. **Floats, incorporating a water rudder steering system, replace the landing gear. A water rudder retraction handle, connected to the dual water rudders by cables, is located on the cabin floor.**
2. **Additional fuselage structure is added to support the float installation.**
3. **An additional structural "V" brace is installed between the top of the front door posts and the cowl deck.**
4. **The airplane has additional corrosion-proofing and stainless steel cables.**
5. **Interconnect springs are added between the rudder and aileron control systems.**
6. **The standard propeller is replaced with a propeller of larger diameter (80 inches).**
7. **Hoisting provisions are added to the top of the fuselage.**
8. **Fueling steps and assist handles are mounted on the forward fuselage, and steps are mounted on the wing struts to aid in refueling the airplane.**
9. **Floatplane placards are added.**
10. **A heavier rudder trim bungee is added.**
11. **Two tail cone rudder centering bungees are added.**

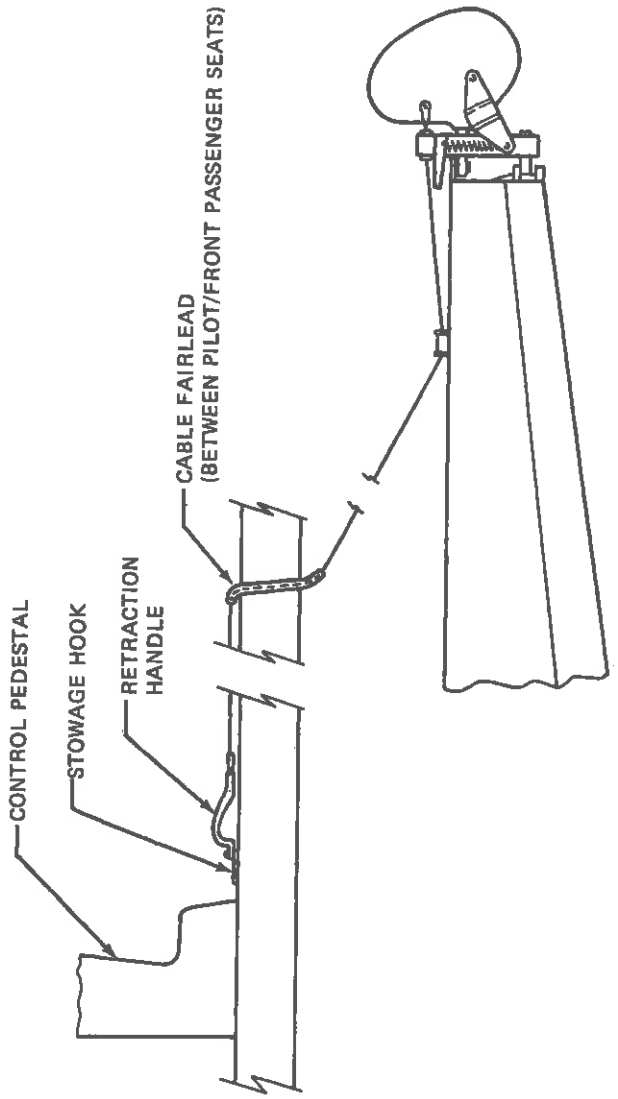


Figure 7-1. Water Rudder Retraction System

WATER RUDDER SYSTEM

Retractable water rudders (figure 7-1), mounted at the aft end of each float, are connected by a system of cables and springs to the rudder pedals. Normal rudder pedal operation moves the water rudders to provide steering control (figure 7-2) for taxiing.

A water rudder retraction handle, located on the cabin floor between the front seats, is used to manually raise and lower the water rudders. During takeoff, landing, and in flight, the handle should be secured on the stowage hook located on the cabin floor just aft of the control pedestal. With the handle in this position, the water rudders are up. When the handle is removed from the hook and allowed to move full aft, the water rudders extend to the full down position for taxiing.

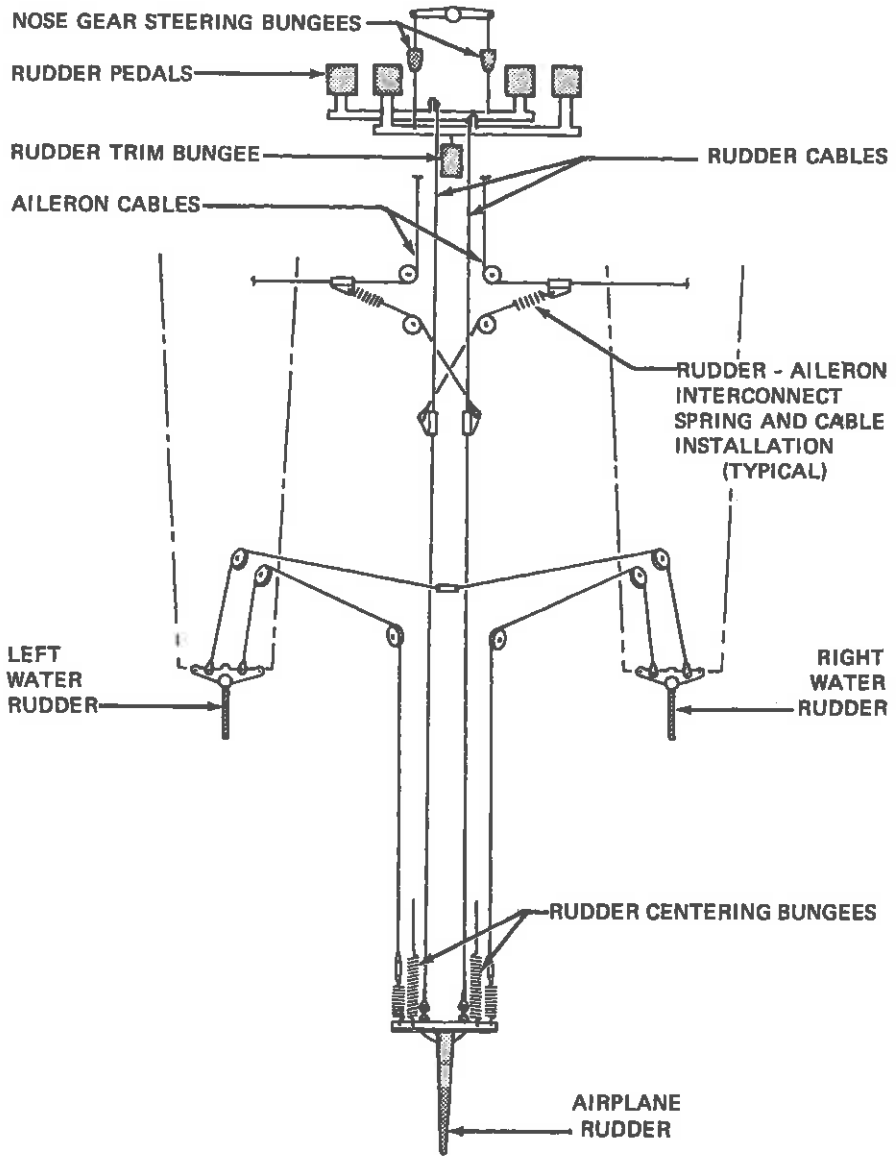


Figure 7-2. Water Rudder Steering System

SECTION 8
AIRPLANE HANDLING, SERVICE & MAINTENANCE

INTRODUCTION

Section 8 of the Hawk XP Pilot's Operating Handbook applies, in general, to the floatplane. The following recommended procedures apply specifically to floatplane operation. (Cleaning and maintenance of the floats should be accomplished as suggested in the Edo Corporation Service and Maintenance Manual for Floats.)

MOORING

Proper securing of the floatplane can vary considerably, depending on the type of operation involved and the facilities available. Each operator should use the method most appropriate for his operation. Some of the most common mooring alternatives are as follows:

1. The floatplane can be moored to a bouy, using a yoke tied to the forward float cleats, so that it will freely weathervane into the wind.
2. The floatplane can be secured to a dock using the fore and aft cleats of one float, although this method is generally not recommended unless the water is calm and the floatplane is attended.
3. The floatplane may be removed from the water (by use of a special lift under the spreader bars) and secured by using the wing tie-down rings and float cleats. If conditions permit the floatplane to be beached, ensure that the shoreline is free of rocks or abrasive material that may damage the floats.

SECTION 1. GENERAL:

This modification consists of two supplemental type certificates (STC). STC SE1436CE allows modification of the Continental IO-360-K and IO-360-KB engine to run at 210 horsepower for takeoff. STC SA1437CE allows use of the modified engine in the Cessna R172K airplanes.

SECTION 2. LIMITATIONS:

Engine Model Number: IO-360-KC/SE1436CE or
IO-360-KBC/SE1436CE

Engine Operating Limits for takeoff and continuous operations:

Takeoff Power - 5 minutes - Full Throttle, 2800 RPM
(210 BHP)

Maximum Continuous Power - Full Throttle, 2600 RPM
(195 BHP)

Propeller Blade Angle at 30 inch station:
Landplane - Low 9.7°
Floatplane - Low 9.8°

Powerplant Markings:

Tachometer:
2200 through 2600 - green arc
2600 through 2800 - yellow arc
2800 - red radial line

Fuel Flow:
3 psi - red radial line
4.5 through 11.5 gal/hr - green arc
18 gal/hr (18.55 psi) - red radial line

Placards:

Adjacent to existing fuel flow placard:

FUEL FLOW
FULL THROTTLE AND 2800 RPM
S.L. ..... 17 GPH
4000 FT. ..... 15 GPH
8000 FT. ..... 13 GPH
12000 FT. ..... 11 GPH

FAA Approved
Date: October 17, 1978
Revision A: January 28, 1982
Revision B: January 28, 1991

92-196

SECTION 3. EMERGENCY PROCEDURES - No change

SECTION 4. NORMAL PROCEDURES:

Takeoff:
Power - Full Throttle and 2800 RPM

SECTION 5. PERFORMANCE:

The performance of this airplane equipped with STC SE1436CE and SA1437CE is equal to or better than the performance as listed in the original FAA approved Airplane Flight Manual.

SECTION 6. EQUIPMENT LIST - No change

SECTION 7. AIRPLANE & SYSTEMS DESCRIPTIONS - No change

SECTION 8. AIRPLANE HANDLING SERVICE & MAINTENANCE - No change

FAA Approved
Date: October 17, 1978
Revision A: January 28, 1982
Revision B: January 28, 1991

© Brad E. Isham 1991
P.O. Box 193
Valley Center, Kansas 67147
(316)755-0713

FAA APPROVED
AIRPLANE FLIGHT MANUAL SUPPLEMENT
FOR
CESSNA R172K
WITH
BRAD E. ISHAM 210 HORSEPOWER MODIFICATION INSTALLED

Registration Number N736NN

Serial Number R1722659

This supplement must be included in Section 9 of the pilot's operating handbook and FAA approved Airplane Flight Manual dated July 1, 1978 or subsequent reissue date when Brad E. Isham 210 brake horsepower (BHP) engine installation is installed in accordance with STC's SE1436CE and SA1437CE. The information contained herein supplements or supersedes the basic manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the basic airplane flight manual.

FAA Approved: for Lawrence A. Herron, Manager
Aircraft Certification Office
Federal Aviation Administration
Wichita, Kansas

Date: October 17, 1978

Revision Date: January 28, 1991