

34 foot Pilot house cutter.

Intended Use: Coastal cruising, cruising Puget Sound and connected waters with occasional offshore cruising in good weather. Not intended for racing or extended offshore cruising. Overnights and weekends, occasionally longer trips. Accommodations for two with one or two guests. Possible live aboard for one or two. Sail rig to be handled by two but configured to be single handed. Cutter rig to allow for more sail variations. Can be rigged as a yawl with a small mizzen aft of the cockpit. The jib would have a jib boom with a track to allow for easy tacking without having to go forward and to prevent the jib hanging up on the mast. The main sail would have a trolley for the mainsheet to provide easier control of the main sail.

Hull: appearance is traditional, that of a Friendship Sloop. Hull is slightly shallower and beamier. The extra beam is to add volume and form stability to compensate for the shallow keel. Below the designed waterline the hull is more modern with a separate keel and rudder. The keel is not a true fin keel. A fin keel would be too deep. A full keel would not provide the up wind performance and control of a separate rudder and fin keel so a compromise of a longer keel and a spade rudder provides good upwind performance and rudder control. So a modified full keel fits the needs better. Also it can withstand grounding on very rock shores in the Pacific northwest and allow entry to shallower waters than a fin. At the same time it protects the rudder from grounding. There is a separate rudder to provide better control with a narrow skeg in front of the rudder to prevent stalling and damage to the rudder post.

Engine. A sail drive (Yanmar, Volvo, Perkins) under the cockpit to allow ease of access and easy removal. Two fuel tanks will be placed to port and starboard of the engine, under the cockpit sole. Fuel is diesel for cost, safety and availability. Also this makes it possible to use bio diesel or other alternative fuels that work in diesels and they would meet all EPA requirements. Based on 3 gal (11L) per hour at hull speed, 7 knots, and 60 gals (227 L) a conservative 20 hours of running time and a range of 100 miles (161 km). Room is available for large tanks.

Electrical would be a 12 Volt DC system only. No AC. Thus no need for shore tie, generator, AC circuit breaker panel, ELCI, transformer or galvanic isolator. It would deliberately be kept simple. Charging would be from the engine or solar panels. All onboard electronics would be DC. There would not be an AC refrigerator. There would be a combo freezer/icebox. Air conditioning is not needed in the Pacific Northwest so there is no need for an air conditioner. There will be a house battery bank, of four deep cycle batteries and a separate starting battery. Provision will be made for an emergency battery to power marine radios or other emergency equipment. Interior lighting and navigation lighting will be LED.

Accommodations: the pilot house is the main accommodation space with seating for four or more. It provides the main sleeping, eating and lounging area. There is also a chart table with cabinets adjacent to the helm. The helmsman is raised about ten inches above the main sole so they have adequate visibility out the pilot house windows. Outboard of the helm is a narrow quarter berth for an individual. Immediately forward of the pilot house is a u-shaped galley on the starboard side, and a head with shower on the port side. In the bow is a double berth with storage under. This double berth would be

most useable in port or at anchor. There is a fore peak area for anchor chain. The mast is in the passage way between the galley and forward berth so it does not intrude into any living area. All areas under berths would be available for storage.

The cockpit area is for controlling and handling sails, steering when the weather is good, and for lounging. It is deep so good drainage is supplied with large scuppers. The cockpit floor is a sealed watertight hatch covering the engine, fuel tanks, battery banks and steering mechanism. There will be a socket for a tiller which can be used to control the rudder directly in an emergency. The emergency rudder is located under the cockpit seat by removing the rear section. This also gives access to a door leading to the lazarette. All lines from the mast and sails will lead to the pilot house top and aft to the cockpit so they can be handled without leaving the cockpit. The exception would be a large Genoa sail with leads back to the aft end of the cockpit. Cockpit seating would also provide storage under the seats.

Construction can be fiberglass, or cold molded wood, or aluminum. Ballast will be lead or iron. There will be no inside ballast.

## Design Parameters

Design Length	34	feet	35 feet with bowsprit.
Length Overall	33.587	Feet	
Length Waterline	29.397	Feet	
Max Beam	13.357	Feet	
Design Draft (Canoe Body)	2.5	Feet	
Total Draft	4.5	Feet	
Midship Location	17.00	Feet	
Water Density	64	lbs/cu ft	
displaced Volume	271.77	cu ft	
Displacement	7.763	tons	
Total Length of submerged body	29.397	Feet	
Total Beam of submerged body	12.079	Feet	
Cabin Head room Pilot house	6.5	Feet	
Galley/Head head room	5.29	Feet	
sail Area (estimated)	760	Sq. feet	
Wetted surface	266.34 sq ft		
LOA/Bmax	33.587/13.357		2.515
LWL/Draft	29.397/4.5		11.7588
LWL/(Disp) <sup>2/3</sup>	29.397/(7.763) <sup>2/3</sup>		14.85
LOA/LWL	33.247/29.397		1.13
Displ/Length Ratio	7.763/(29.397/100) <sup>3</sup>		305
Length/Displ Ratio	33.587/7.763		4.327
Sail Area/Disp Ratio	760/42		18
Sail Area/Wetted Surface	266.34 x 2.2		586
	266.34 x 2.4		639

Kasten Sail area formula min sail area = 5 X (lb disp)<sup>1/2</sup> = 5 X (15520)<sup>1/2</sup> = 622.8

Tom Colvin Formula WL X WL Beam x 2.75 = 30 x 12 x 2.75 = 990

or Wetted surface 266.34 x 3.75 = 997

Sail Area/Disp = SA/(disp)<sup>2/3</sup> (disp)<sup>2/3</sup> = (271.77)<sup>2/3</sup> = 42

using a SA/D ratio of 19;

estimated sail area = 19 x 42 = 798 Sq ft

Froude number FN = V/ (g x LWL)<sup>1/2</sup> = V/ (32 Ft/sec -29.397)<sup>1/2</sup> = 7.27 / 30.67= **0.237**

V= 1.34 X (LWL)<sup>1/2</sup> = 1.34 X (29.397)<sup>1/2</sup> = 1.34 x 5.42 = 7.27