

Antonio Salguero

Sound Boats

Updated Weight Estimate**84' Aluminum M/V SCAPHA**

Vessel re-weighed 9-3-02

Vessel Particulars

Calcs based on LWL 8.25" above Hargrave's DWL

LOA (including swimstep)	83.84 ft.
LWL (as measured 5/21/02)	65.50 ft.
Displacement	160,187 lbs.
Displacement	72 long tons
DLR	251
LCB	0.574
LCF	0.565
PPI (lbs)	5,228 lbs.
Moment Trim 1" (calculated)	16,703 ft-lbs

Notes:

1. All units are imperial
2. All CG's were measured from an origin determined by the the intersection of FP (Station 0), the longitudinal CL and the baseline (shop floor)
3. Weights fwd of Station 0 are negative
4. Weights to port of the longitudinal CL are negative
5. The whole vessel VCG is not determined in this weight estimate

Loading Conditions

Galley provisions (400 lbs.) and all other payloads and consumables were assumed to be fixed loads

Ready for Sea :

Forward 1000 gal Diesel full
 240 gal Sewage empty
 155 gal Sump empty
 Main 1840 gal Diesel full
 Reserve 1250 gal Diesel full
 875 gal Water full
 100 gal Gasoline in Swimstep full

Coastal Cruising:

Forward 1000 gal Diesel empty
 240 gal Sewage @ 50% full
 155 gal Sump @ 50% full
 Main 1840 gal Diesel @ 100% full
 Reserve 1250 gal Diesel empty
 875 gal Water @ 80% full
 100 gal Gasoline in Swimstep @ 100%

Half Range:

Forward 1000 gal Diesel empty @ 25% full
 240 gal Sewage @ 50% full
 155 gal Sump @ 50% full
 Main 1840 gal Diesel @ 50% full
 Reserve 1250 gal Diesel @ 90% full
 875 gal Water @ 90% full
 100 gal Gasoline in Swimstep @ 50% full

Heavy Ship:

all tanks full

Full Range:

Forward 1000 gal Diesel empty
 240 gal Sewage @ 80% full
 155 gal Sump @ 80% full
 Main 1840 gal Diesel empty
 Reserve 1250 gal Diesel @ 90% full
 875 gal Water @ 80% full
 100 gal Gasoline in Swimstep @ 50% full

Light Ship:

All tanks empty

Summary of Weights & Centers for Whole Vessel

	Weight	LCG	L Moments	VCG	V Moments	TCG	Γ Moments
	lbs	ft from FP	ft-lbs	ft from BL	ft-lbs	ft from CL	ft-lbs
Ready for Sea	173,480	37.75	6,549,093	0	0	-0.01	-1,274
Half Range	160,902	37.95	6,105,838	0	0	-0.01	-1,274
Full Range	152,566	37.77	5,761,990	0	0	-0.01	-1,274
Coastal Cruising	157,145	37.64	5,915,657	0	0	-0.01	-1,274
Heavy Ship	176,785	37.64	6,653,842	0	0	-0.01	-1,274
Light Ship	135,519	35.76	4,846,097	0	0	-0.01	-1,274

Trim Analysis based on LWL 8.25" above Hargrave's

Longitudinal:

LCB from Lines Plan	0.574	=	37.60	ft aft station 0
LCF from Lines Plan	0.565	=	37.01	"
LCG Ready for Sea			37.75	"
LCG Half Range			37.95	"
LCG Full Range			37.77	"
LCG Coastal Cruising			37.64	"
LCG Heavy Ship			37.64	"
LCG Light Ship			35.76	"

Trim Arm (difference between LCB and LCG)

Ready for Sea	0.15		ft	
Half Range	0.35		"	
Full Range	0.17		"	
Coastal Cruising	0.05		"	
Heavy Ship	0.04		"	
Light Ship	-1.84		"	

Longitudinal Trim Moments (trim arm x displacement at that loading condition)

Ready for Sea			26,784	ft-lbs
Half Range			56,422	"
Full Range			25,976	"
Coastal Cruising			7,476	"
Heavy Ship			7,252	"
Light Ship			-249,011	"

Moment to Trim 1" 16,703 ft-lbs

Total Longitudinal Trim:

Distirbution of Trim

Positive=stern down, Negative=bow down

			Bow		Stern	
Ready for Sea	1.60	in.	0.91	in.	0.70	in.
Half Range	3.38	"	1.91	"	1.47	"
Full Range	1.56	"	0.88	"	0.68	"
Coastal Cruising	0.45	"	0.25	"	0.19	"
Heavy Ship	0.43	"	0.25	"	0.19	"
Light Ship	-14.91	"	8.42	"	6.49	"

Transverse:

TCG Ready for Sea	-0.007		ft	
TCG Half Range	-0.008		"	
TCG Full Range	-0.008		"	
TCG Coastal Cruising	-0.008		"	
TCG Heavy Ship	-0.007		"	
TCG Light Ship	-0.009		"	

Transverse Trim Moments:(trim arm x displacement at that loading condition)

Positive=starboard down, Negative=port down)

Ready for Sea			-1,274	ft-lbs
Half Range			-1,274	"
Full Range			-1,274	"
Coastal Cruising			-1,274	"
Heavy Ship			-1,274	"
Light Ship			-1,274	"

Description	Quantity	Unit	Total	LCG		L Moments	VCG	V Moments	TCG	T Moments	
	Sq. Ft. Area Lineal Ft.	Weight lbs	Weight lbs	ft	from FP	ft-lbs	ft	from BL	ft	from CL	ft-lbs
Vessel as weighed by Townsend Bay Marine 9/3/02:											
W 1 (stbd aft)			54,350	45.83		2,490,861	0.00	0	0.00		0
W 2 (port aft)			54,023	45.83		2,475,874	0.00	0	0.00		0
W 3 (stbd fwd)			22,000	13.50		297,000	0.00	0	0.00		0
W 4 (port fwd)			22,000	13.50		297,000	0.00	0	0.00		0
Total Weight by TBM	152,373										
Deleted Weights:											
Aft Cradle			-4,240	45.83		-194,319	0.00	0	0.00		0
Fwd. Cradle			-4,240	13.50		-57,240	0.00	0	0.00		0
1840 gal diesel in 1840 gal diesel	1840	-7.35	-13,524	45.00		-608,580	0.00	0	0.00		0
350 gal diesel in 1250 gal diesel tank	350	-7.35	-2,573	53.75		-138,272	0.00	0	0.00		0
Additional Weights (items to be installed):											
<u>Swimstep, Cockpit, Lazarette Areas:</u>											
Cockpit Docking Winches	2	20	40	64.83		2593.20	0.00	0.00	0.00		0.00
Lazarette Contents	1	200	200	62.50		12500.00	0.00	0.00	0.00		0.00
Fishing poles/tackle	1	40	40	60.00		2400.00	0.00	0.00	0.00		0.00
New Name	1	50	50	60.50		3025.00	0.00	0.00	0.00		0.00
<u>Patio Area:</u>											
BBQ	1	440	440	59.83		26325.20	0.00	0.00	0.00		0.00
Propane Bottles/Locker	1	30	30	58.75		1762.50	0.00	0.00	-5.00		-150.00
Patio Table	1	80	80	52.50		4200.00	0.00	0.00	0.00		0.00
Wing Doors	2	35.00	70	44.00		3080.00	0.00	0.00	0.00		0.00
Settee Cushions	1	40.00	40	51.50		2060.00	0.00	0.00	0.00		0.00
<u>Pilot House Top, Boat Deck Areas:</u>											
Shore Boat	1	2000	2000	50.50		101000.00	0.00	0.00	0.00		0.00
<u>Pilot House:</u>											
Floor Coverings	154	0.60	92	34.00		3141.60	0.00	0.00	0.00		0.00
Locker Contents	1	150	150	38.00		5700.00	0.00	0.00	0.00		0.00
Fridge	1	100	100	36.00		3600.00	0.00	0.00	0.00		0.00
<u>Master Stateroom:</u>											
Floor Coverings	97	0.60	58	54.00		3142.80	0.00	0.00	0.00		0.00
Mattress and Bedding	1	120	120	57.50		6900.00	0.00	0.00	0.00		0.00
TV	1	10	10	57.50		575.00	0.00	0.00	0.00		0.00
DVD player	1	5	5	57.50		287.50	0.00	0.00	0.00		0.00
Locker Contents	1	200	200	57.00		11400.00	0.00	0.00	0.00		0.00

Description	Quantity	Unit	Total	LCG		VCG	V Moments	TCG	T Moments
	Sq. Ft. Area Lineal Ft.	Weight lbs	Weight lbs	ft	from FP	ft from BL	ft-lbs	ft from CL	ft-lbs
Tankage:									
Note: forward diesel tank has been reduced in capacity from stairway insert from 1200 gal to approx. 1000 gal									
<u>Ready for Sea :</u>									
Forward 1000 gal Diesel full	1,000	7.35	7,350	13.67	100,475	0.00	0.00	0.00	0.00
240 gal Sewage empty	0	8.40	0	29.25	0	0.00	0.00	0.00	0.00
155 gal Sump empty	0	8.32	0	35.50	0	0.00	0.00	0.00	0.00
Main 1840 gal Diesel full	1,840	7.35	13,524	45.00	608,580	0.00	0.00	0.00	0.00
Reserve 1250 gal Diesel full	1,250	7.35	9,188	53.75	493,828	0.00	0.00	0.00	0.00
875 gal Water full	875	8.32	7,280	63.00	458,640	0.00	0.00	0.00	0.00
100 gal Gasoline in Swimstep full	100	6.19	619	67.00	41,473	0.00	0.00	0.00	0.00
Totals			37,961	1,702,996		0.00		0.00	
<u>Half Range:</u>									
Forward 1000 gal Diesel empty @	250	7.35	1,838	13.67	25,119	0.00	0.00	0.00	0.00
240 gal Sewage @ 50% full	120	8.40	1,008	29.25	29,484	0.00	0.00	0.00	0.00
155 gal Sump @ 50% full	78	8.32	645	35.50	22,890	0.00	0.00	0.00	0.00
Main 1840 gal Diesel @ 50% full	920	7.35	6,762	45.00	304,290	0.00	0.00	0.00	0.00
Reserve 1250 gal Diesel @ 90% full	1,125	7.35	8,269	53.75	444,445	0.00	0.00	0.00	0.00
875 gal Water @ 90% full	788	8.32	6,552	63.00	412,776	0.00	0.00	0.00	0.00
100 gal Gasoline in Swimstep @ 50%	50	6.19	310	67.00	20,737	0.00	0.00	0.00	0.00
Totals			25,383	1,259,741		0.00		0.00	
<u>Full Range:</u>									
Forward 1000 gal Diesel empty	0	7.35	0	13.67	0	0.00	0.00	0.00	0.00
240 gal Sewage @ 80% full	192	8.40	1,613	29.25	47,174	0.00	0.00	0.00	0.00
155 gal Sump @ 80% full	124	8.32	1,032	35.50	36,625	0.00	0.00	0.00	0.00
Main 1840 gal Diesel empty	0	7.35	0	45.00	0	0.00	0.00	0.00	0.00
Reserve 1250 gal Diesel @ 90% full	1,125	7.35	8,269	53.75	444,445	0.00	0.00	0.00	0.00
875 gal Water @ 80% full	700	8.32	5,824	63.00	366,912	0.00	0.00	0.00	0.00
100 gal Gasoline in Swimstep @ 50%	50	6.19	310	67.00	20,737	0.00	0.00	0.00	0.00
Totals			17,047	915,893		0.00		0.00	
<u>Coastal Cruising:</u>									
Forward 1000 gal Diesel empty	0	7.35	0	13.67	0	0.00	0.00	0.00	0.00
240 gal Sewage @ 50% full	120	8.40	1,008	29.25	29,484	0.00	0.00	0.00	0.00
155 gal Sump @ 50% full	78	8.40	651	35.50	23,111	0.00	0.00	0.00	0.00
Main 1840 gal Diesel @ 100% full	1,840	7.35	13,524	45.00	608,580	0.00	0.00	0.00	0.00
Reserve 1250 gal Diesel empty	0	7.35	0	53.75	0	0.00	0.00	0.00	0.00
875 gal Water @ 80% full	700	8.32	5,824	63.00	366,912	0.00	0.00	0.00	0.00
100 gal Gasoline in Swimstep @	100	6.19	619	67.00	41,473	0.00	0.00	0.00	0.00
Totals			21,626	1,069,560		0.00		0.00	
<u>Heavy Ship:</u>									
Forward 1000 gal Diesel full	1,000	7.35	7,350	13.67	100,475	0.00	0.00	0.00	0.00
240 gal Sewage full	240	8.40	2,016	29.25	58,968	0.00	0.00	0.00	0.00
155 gal Sump full	155	8.32	1,290	35.50	45,781	0.00	0.00	0.00	0.00
Main 1840 gal Diesel full	1,840	7.35	13,524	45.00	608,580	0.00	0.00	0.00	0.00
Reserve 1250 gal Diesel full	1,250	7.35	9,188	53.75	493,828	0.00	0.00	0.00	0.00
875 gal Water full	875	8.32	7,280	63.00	458,640	0.00	0.00	0.00	0.00
100 gal Gasoline in Swimstep full	100	6.19	619	67.00	41,473	0.00	0.00	0.00	0.00
Totals			41,266	1,807,744		0.00		0.00	