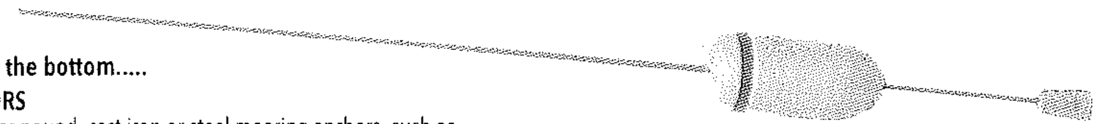
MOORING SYSTEMS

Here in Maine, where everyday tides reach twelve feet, many harbors have rough exposures and different coastlines from high to low tide. To accommodate this, most work and pleasure boats are moored rather than docked. The most reliable mooring systems are those tested by time and gradually improved through technology. Below, you will see what we have found works best in mud bottoms. Always check with your local harbormaster for type recommendations. In Maine, all harbors are unique and need local knowledge for the best system.

Example of hardshell hook-up. No swivel required at buoy. Place swivel between top and bottom chain.



Start at the bottom.....

ANCHORS
Pound for pound, cast iron or steel mooring anchors, such as mushrooms or the Dor-Mor pyramids, are far superior to granite or concrete blocks in mud bottoms. Concrete loses nearly half its weight in water, granite over a third; cast iron and steel weigh-in with about a 14% loss of weight in water. In addition, the digging properties of mushrooms and pyramids in mud bottoms increase their holding power. A rule of thumb for choosing metal mooring anchor weight in mud bottoms is 10-20 pounds per foot of boat.

HEAVY (BOTTOM) CHAIN
A good chunk of heavy chain (it need not be galvanized) is a crucial component of the mooring system. It will set and hold the anchor properly, create a catenary curve in the rode and absorb the shock of sudden, hard pulls. The length of heavy chain should be 1.5 times the maximum depth of the water at high tide.

LIGHT (TOP) CHAIN
Galvanized chain is recommended for the top and should equal the maximum depth of the water at high tide plus 5 feet. We strongly recommend long-link mooring chain which allows for efficient use of shackles. 3/8" to 1/2" are common sizes for boats 20' to 45' in length.

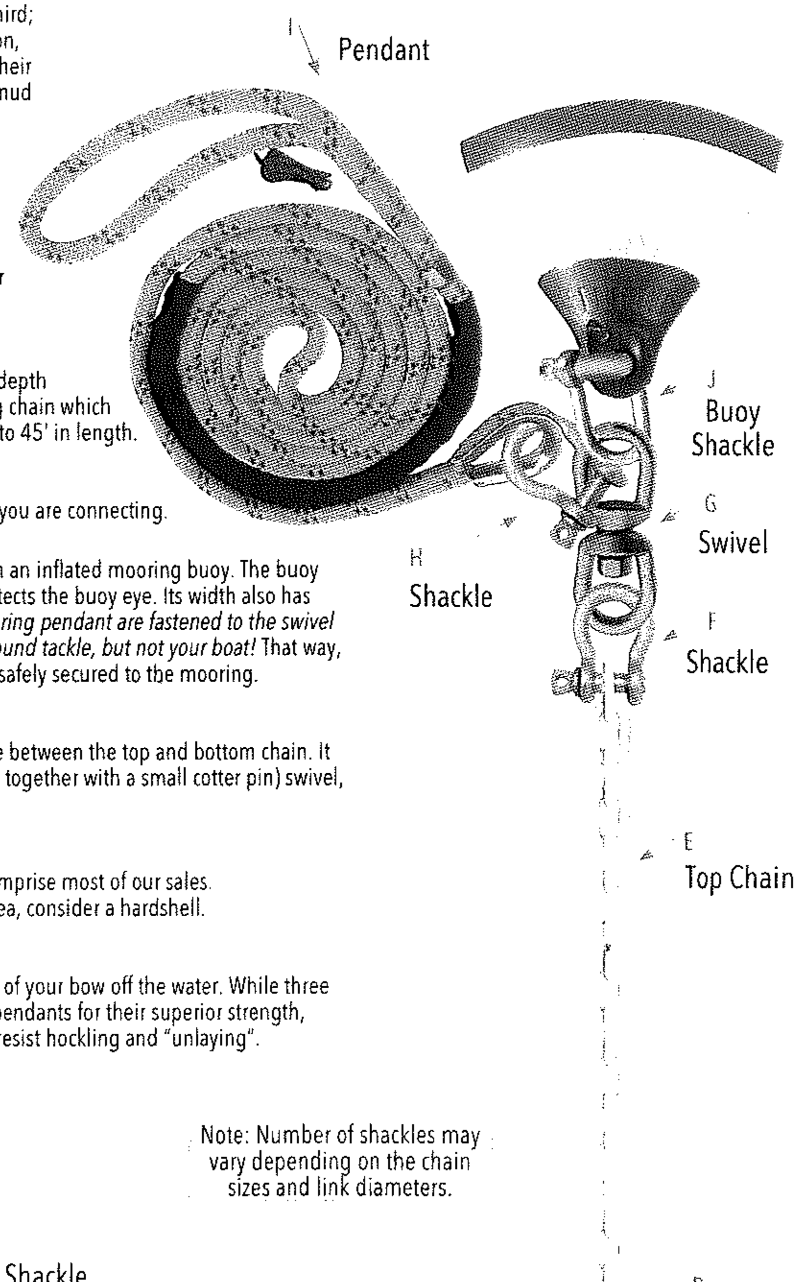
SHACKLES
To avoid weak linkage use shackles a size larger than that of the chain to which you are connecting. All shackles should be safety wired with .041" stainless steel safety wire.

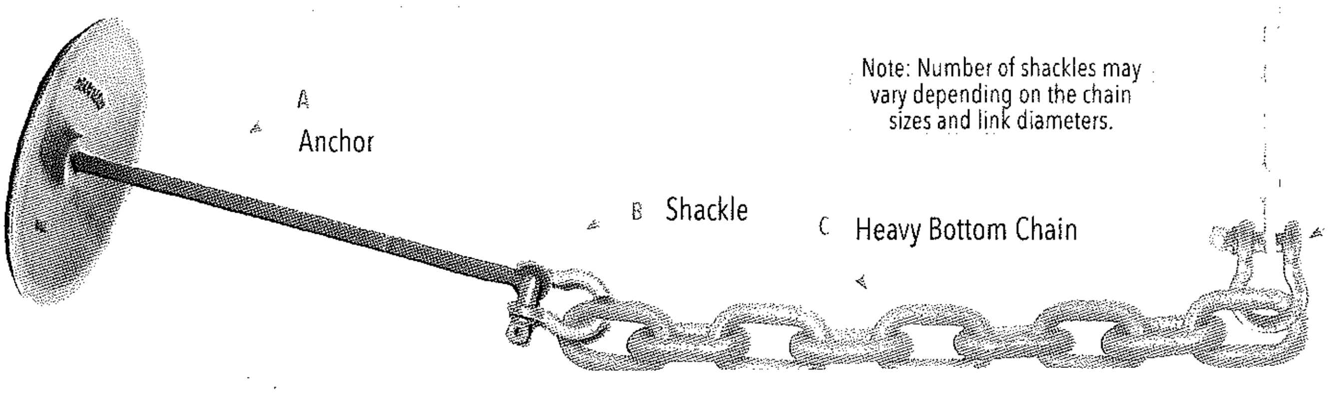
Note: The illustration shows a buoy shackle, not an anchor shackle, for use with an inflated mooring buoy. The buoy shackle easily fits the eye of the buoy and comes with a PVC bushing which protects the buoy eye. Its width also has the advantage of accommodating the swivel. *It is crucial that the chain and mooring pendant are fastened to the swivel not the buoy shackle. The buoy shackle is designed to hold the buoy and the ground tackle, but not your boat!* That way, should the buoy shackle fail, you will lose only the buoy. Your boat will remain safely secured to the mooring.

SWIVELS
A swivel placed between the mooring buoy and top chain works better than one between the top and bottom chain. It is also easier to inspect for wear. Use an eye to eye (not eye to jaw which is held together with a small cotter pin) swivel, two sizes larger than your top chain.

BUOYS
Given their relative low costs and rugged construction, air inflated net buoys comprise most of our sales. They last a long time if not punctured. If ice or vandals are a problem in your area, consider a hardshell.

PENDANTS
Generally speaking, the length should be a minimum of three times the height of your bow off the water. While three strand nylon is still a reliable choice, we recommend double-braided mooring pendants for their superior strength, abrasion resistance, flexibility, energy absorption and structural integrity. They resist hockling and "unlaying".





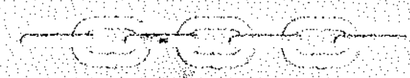
Note: Number of shackles may vary depending on the chain sizes and link diameters.

1. Choose Your Mooring Tackle and Top Chain

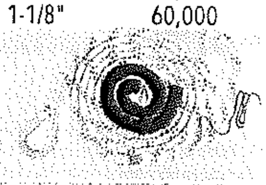
Based on your boat length in the blue column, choose your tackle and top chain. Column letters refer to illustration on the previous page. These guidelines apply to reasonably protected harbors in winds up to 60 mph. Always consult your local harbormaster.

	A	B	C	D	E	F	G	H	I
Boat Length	Mushroom Anchor (lbs)	Shackle to Mushroom	Bottom Chain	Shackle to Bottom Chain	Top Chain	Shackle to Swivel	Swivel	Shackle to Pendant	Pendant Break Strength (lbs)
-	25	5/8" / 1/2"	3/8"	-	3/8"	1/2"	1/2"	1/2"	8000
-	50	5/8" / 1/2"	3/8"	-	3/8"	1/2"	1/2"	1/2"	8000
-	75	5/8"	5/8"	1/2"	3/8"	1/2"	5/8"	1/2"	10,000
-	100	5/8"	5/8"	1/2"	3/8"	1/2"	5/8"	1/2"	10,000
up to 15'	150	3/4"	5/8"	1/2"	3/8"	1/2"	5/8"	1/2"	12,000
up to 20'	200	3/4"	3/4"	1/2"	3/8"	1/2"	5/8"	1/2"	17,000
up to 25'	250	3/4"	3/4"	5/8"	1/2"	5/8"	3/4"	5/8"	23,000
up to 30'	300	7/8"	3/4"	5/8"	1/2"	5/8"	3/4"	3/4"	29,000
up to 35'	350	7/8"	1"	5/8"	1/2"	5/8"	3/4"	7/8"	40,000
up to 40'	400	7/8"	1"	3/4"	5/8"	3/4"	7/8"	1"	50,000
up to 45'	500	7/8"	1"	3/4"	5/8"	3/4"	7/8"	1-1/8"	60,000
-	600-800	1"	1"	3/4"	5/8"	3/4"	7/8"	1-1/8"	60,000
-	over 1000	call for specific design considerations							

Calculating Length:
Bottom Chain = 1.5 times the depth of water at high tide
Top Chain = Depth of water at high tide plus 5 feet.
Pendant = Minimum of 3 times the height of your bow off the water.
Maximum, length of waterline.

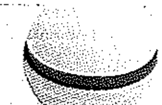


Except for 1", all chain mentioned is "Mooring Chain"



2. Mooring Buoyancy Required

This table calculates the size buoy (based on buoyancy) you will need to float the top chain and tackle.
Buoyancy required includes normal ground tackle.



		Depth of water at High Tide (ft.)									
Top Chain		10'	15'	20'	25'	30'	35'	40'	45'	50'	55'
3/8"	Buoyancy Required (lbs)	22	30	37	45	52	60	67	75	82	90
1/2"	Buoyancy Required (lbs)	41	54	67	80	93	106	119	132	145	158
5/8"	Buoyancy Required (lbs)	-	82	101	120	139	158	177	196	215	234

3. Choose Your Buoy

Refer to blue buoyancy column below and choose the proper buoy, shackle and collar (if necessary).

Refer to previous page for placement

For additional colors see page 135

Buoyancy (lbs.)	Buoy
10	JIM-BUOY Hardshell w/Eyebolt (Hard)
14	Polyform A1
23	JIM-BUOY Hardshell w/Eyebolt (Hard)
33	Polyform A2
45	JIM-BUOY Hardshell w/Eyebolt (Hard)
50	Taylor SUR-MOOR Shackle Buoy (Hard)
60	Polyform A3
80	Taylor SUR-MOOR Taper Buoy (Hard)
95	Polyform A4
100	Jim-Buoy 4403-T-2.5 (Hard)
100	Jim-Buoy 4403-T-3 (Hard)
104	Jim-Buoy 4202-T-2.5 Pendant Buoy (Hard)
195	Polyform A5
200	Jim-Buoy 4404-T-3 (Hard)
460	Jim-Buoy 4203-T-2.5 Pendant Buoy (Hard)
390	Polyform A6
240	Jim-Buoy 4204-T-3 Pendant Buoy (Hard)

The above recommendations are for reference only. Requirements vary considerably depending on boat design, harbor conditions and type of bottom. Always consult your local harbormaster. The mushroom anchor manufacturer recommends ten lbs. of mushroom for every foot of boat length, for winds up to 60 MPH. For open harbors, poor holding ground, hurricane or winter moorings, always increase mushroom, chain and pendant size and scope.