

Tether & Handling System Trade Study

Project: Benthic Observational Lander
 Date: 1/31/17
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Grades	Level
1	Not Acceptable
2	Substandard
3	Meets Requirements
4	Moderately Meets
5	Greatly Exceeds Requirements

Criteria	Weight (%)	FO Tether w/ Winch	FO Est Cost	Grade	Weighted Grade	Coax Tether w/winch	Coax Est Cost	Grade	Weighted Grade
Data Capacity	5%	10 GBps Max		5	0.25	24 Mbps up/1 down		3	0.15
Strength	5%	10 kN SWT 50kN NBL		4	0.2	17kN SWT		4	0.2
Size	3%	0.622" ø		3	0.075	0.322" ø		4	0.1
Weight (air) 400m	3%	280 kg/km		3	0.075	266 kg/km		3	0.075
Weight (water)	3%	80 kg/km		3	0.075	224 kg/km		5	0.125
Cost Tether	5%	12 \$/m	\$ 4,800.00	3	0.15	4 \$/m	\$ 1,600.00	4	0.2
Power Carrying	10%	600V 18AWG/7C Rated		3	0.3	1200V 18/14AWG/2C Coax		2	0.2
Mechanical Termination	5%	Kevlar potted BSR	??	3	0.15	Wire Termination w/ BSR	??	4	0.2
Field-Retermination	5%	Requires FO Kit & Jbox	\$ 1,500.00	3	0.15	Basic Kit No Jbox (field Splice)	\$ 60.00	4	0.2
Converter Cost	5%	SingleMode 2x 1000 Gbit/s	\$ 400.00	3	0.15	ADSL Filter	\$ 100.00	3	0.15
Connector Cost	5%	High	\$ 500.00	3	0.15	Low	\$ 200.00	4	0.2
Slip Ring Cost	5%	High	\$ 5,000.00	3	0.15	Mid	\$ 1,000.00	4	0.2
Ease of Handling	5%	Large sheave	\$ 1,000.00	3	0.15	Small sheave	\$ 500.00	4	0.2
Application Scalability	3%	Nearly Unbounded		5	0.125	Would Support 4x SD video		3	0.075
Field Application	5%	Dedicated Winch & Tether		3	0.15	UNOLS / MBARI / Shana Rae Comp.		5	0.25
Depressor Weight Req'd	5%	Yes	\$ 500.00	3	0.15	No	\$ -	4	0.2
Design Impact	5%	Current Design		3	0.15	New Design Changes (Batteries?)		2	0.1
Use on variety of ships	3%	at >5HP (3.2kW), may req 3ø power		3	0.075			5	0.125
Footprint	3%	4'x7'		3	0.075	4'x4'		3	0.075
Portability	5%	Mid		3	0.15	High		4	0.2
Cost Winch	10%	60K\$ Loose Quote	\$ 60,000.00	3	0.3	20-30K\$ Loose Quote	\$ 25,000.00	4	0.4
	100%		\$ 73,700.00		3.2		\$ 28,460.00		3.625

FO Tether Datasheet <http://www.macartney.com/what-we-offer/systems-and-products/connectivity/stock-cables/hybrid-cable-kevlar-type-3762k/>
 Coax DataSheet <http://www.te.com/commerce/DocumentDelivery/DDEController?Action=srchrtv&DocNm=A320327&DocType=Customer+Drawing&DocLang=English&DocFormat=pdf&PartCntxt=A320327>