

DIGITAL OCEAN EXPLORATION

**Application for Experimental License to Operate Multi-Band Earth Stations on Board a Limited
Number of Maritime Vessels**

Narrative Statement

(1) Name, address, phone number (also e-mail address and facsimile number, if available) of the applicant.

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(2) Description of why an experimental license is needed

Digital Ocean Exploration (“Digital Ocean”) is seeking authority to conduct limited market studies to evaluate the effectiveness and efficiency of utilizing the Tracking and Data Relay Satellite System (TDRSS) satellites using high-bandwidth channels to support massive data transfers from ships at sea conducting digital mapping activities. Use of these unique, very high capacity satellite links will allow real-time offshore exploration data to be uplinked directly from operational marine seismic vessels and returned to terrestrial High Performance Computer (“HPC”) or scalable Cloud HPC platforms on a concurrent, scheduled transfer basis, resulting in highly improved workflow, ultimately better undersea modeling and high resolution imaging. The customers should benefit from faster, cheaper, better and more secure data, while also reducing the environmental impact in sensitive areas by lessening offshore exploration program cycle time. The improved mapping and imaging capabilities made possible by such data transfer capabilities would also further the policies in the Executive Order on Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States. <https://www.federalregister.gov/documents/2018/06/22/2018-13640/ocean-policy-to-advance-the-economic-security-and-environmental-interests-of-the-united-states>

(3) Description of the operation to be conducted and its purpose

Digital Ocean will install terminals on board up to ten (10) ships under this experimental authorization. This experimental license will provide the requisite authority to operate the terminals on U.S.-flagged vessels or ships operating in U.S.-territorial waters. Digital Ocean is separately entering into agreement with NASA that will allow access to the TDRSS satellites on a scheduled (but preemptible basis). Digital Ocean and its customers will evaluate how the maritime satellite terminals perform with the high-bandwidth channels available on the TDRSS satellites.

For all operations, Digital Global will comply with the radiofrequency radiation exposure limits in 47 C.F.R. 1.1310 and apply the measures recommended in the FCC’s OET Bulletin 65 to ensure compliance. Time and dates of proposed operation

(4) Time and dates of proposed operation

Digital Ocean requests experimental authority for up to two years, commencing with grant of the license. Digital Ocean will notify any other authorized co-channel Ka-band satellite operators at least one week prior to any transmit testing, and provide emergency contact information. In the event that there is harmful interference to other satellite or terrestrial users, Digital Ocean will immediately cease transmissions.

(5) Class(es) of station (fixed, mobile, fixed and mobile) and call sign of station (if applicable).

The transmitting stations will operate in mobile mode.

(6) Description of the location(s) and, if applicable, geographical coordinates of the proposed operation.

The ships that are the subject of this market trial may operate anywhere within U.S. territorial waters, and for U.S.-flagged vessels, in areas outside U.S.-territorial waters.

(7) Transmit equipment to be used, including name of manufacturer, model and number of units.

Intellian v240MT 2.4m, up to 10 units to be deployed on up to ten (10) ships

(8) Frequencies desired.

Transmit:

14.0 – 14.50 GHz

28.35 – 28.4 GHz

28.6 – 29.1 GHz

Receive:

11.7 – 12.75 GHz

17.8 – 18.6 GHz

18.8 – 19.3 GHz

(9) Emission designator (see §2.201 of this chapter) or describe emission (bandwidth, modulation, etc.)

Ku-Band: 2M50G7D to 225MG7D

Ka-Band: 1M00G7D to 650MG7D

(10) Overall height of antenna of antenna structure above the ground (if greater than 6 meters above the ground or an existing structure, see part 17 of this Chapter concerning notification to the FAA).

The overall height of the antennas above existing structures will not exceed 6 meters.

**Exhibit 1: Directional Antenna
Information**

		Ku-band	Ka-band
		14.25 GHz	28.75 GHz
Width of the beam in degrees at the half power point	Azimuth	0.58 °	0.33 °
	Elevation	0.79 °	0.31 °
Power (watts)		20	40
ERP (in dBW and kW)		58.25 dBW 668.34 kW	64.05 dBW 2540.97 kW
Azimuth Sweep Range		±180 °	
Modulating Signal		52 Msps	180 Msps
Frequency Tolerance		±1ppm	
Orientation in horizontal plane (degrees)		TX = RHCP/LHCP RX = RHCP/LHCP	
Orientation in horizontal plane (degrees)		TX = RHCP/LHCP RX = RHCP/LHCP	
Directional Antenna		Yes	