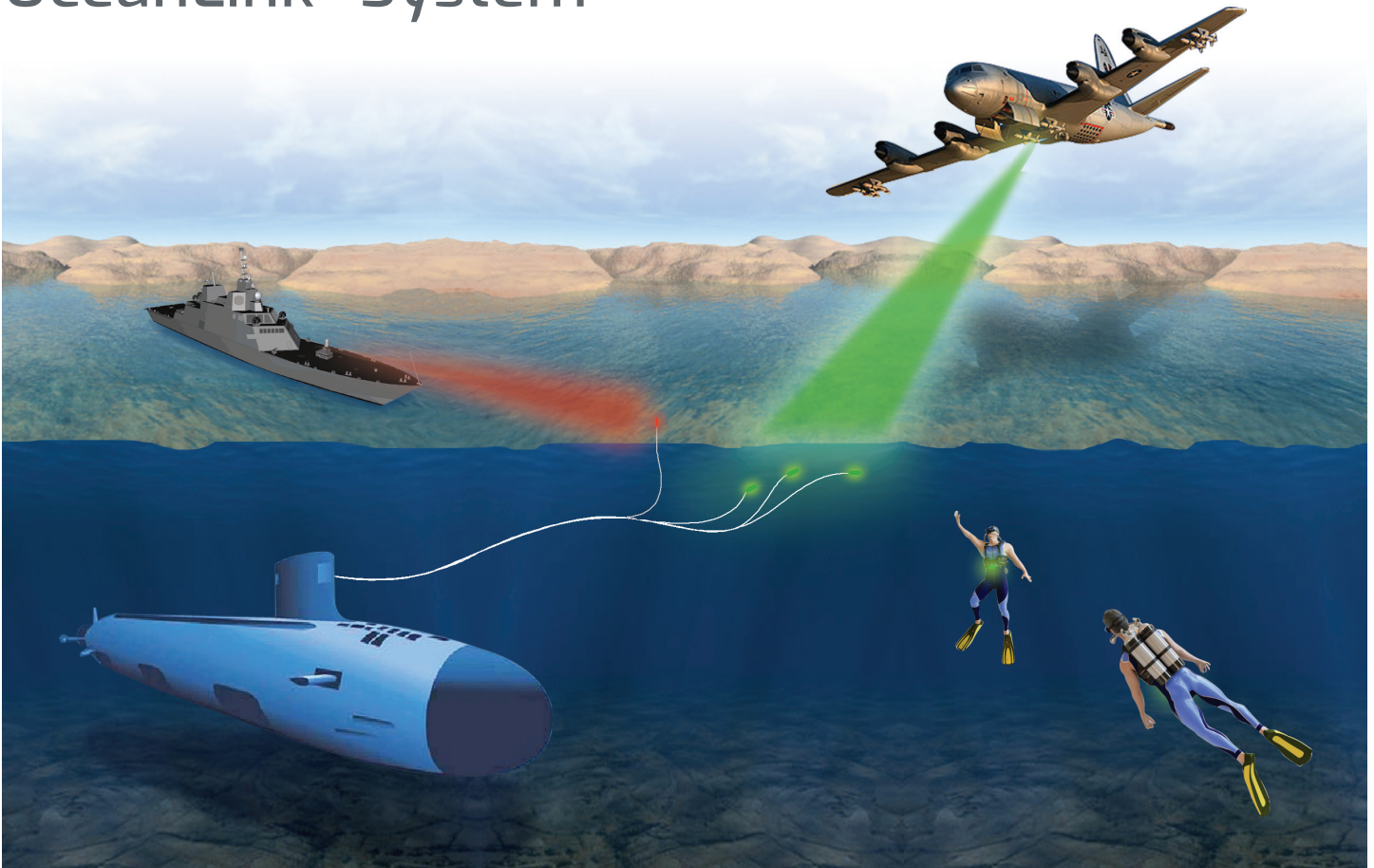


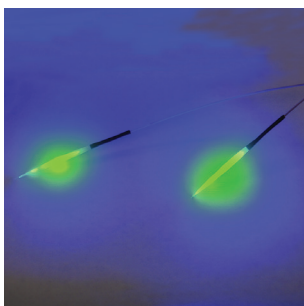
OceanLink™ System



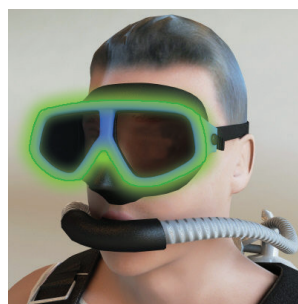
OceanLink™ system is the latest generation of the LightSpeed™ optical communication technology developed by Torrey Pines Logic, Inc. ONR SwampWorks have sponsored the development with the objective to design and build a 2-way non-RF communication system from a submarine to a surface, airborne or underwater platform with as wide an angle of view as possible, while avoiding conspicuous operation and detection by creating a 1-10 Mbps optical channel between a submarine underway and below water surface at distances exceeding 10 km. Single

reinforced fiber fed from the sail, consisting of transmit and receive components. Fiber tips stay 3-5 feet below surface or penetrating surface for variety of communication options.

- Most secure communication technology on the market
- Bi-directional data, voice, and video
- Point-to-point LAN extension
- Long range Free Space Optical (FSO) system
- Perfect for emergency and temporary communications



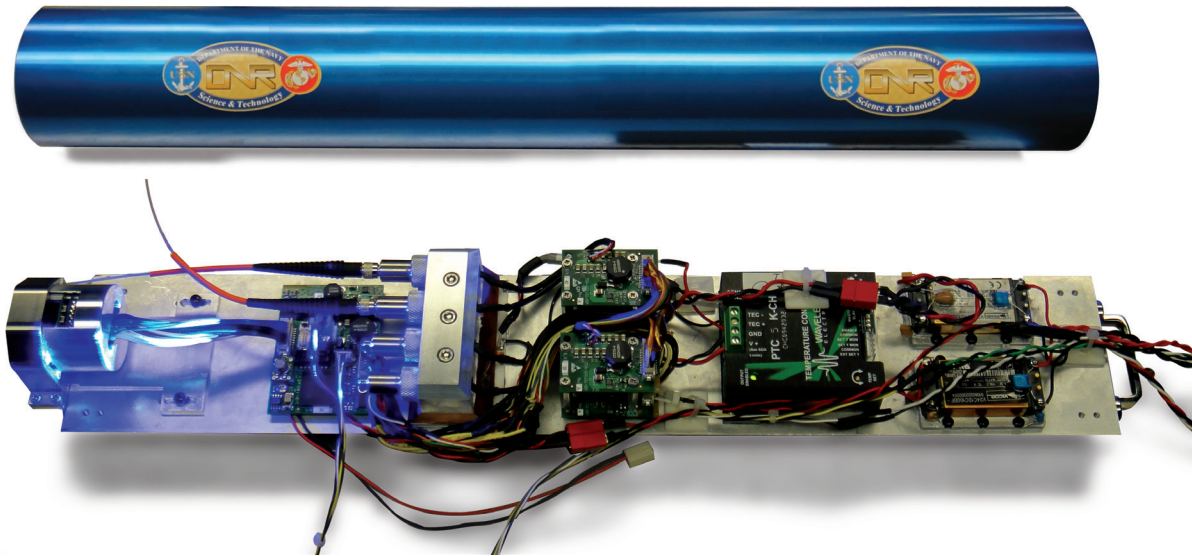
Fiber tip



Fiber/mask integration



Compatible with R10 and B20



Completed Phase I

- Bi-directional voice @ 32 Kbps
- Communication with slant angle up to 65° off zenith
- Laser source in the water, LED source in the air
- Emitted power of 5 mW provides over 100 m
- Link budget provides sustained Mbps rates over 10-15 km
- Operates in full Sun Glint
- Fiber can go up in the air to provide multiple frequencies and channels
- Frequency hopping and spread spectrum technologies
- Forward Error Correction chip
- Distance measurements

Next Phase II

- Full duplex operation
- Data interface with full TCP/IP Ethernet
- Long distance and tracking up to 10-15 km
- Fiber sticking up from water – multiple frequencies
- Underwater to underwater
- Distance measurements
- Fiber mechanical management
- Range testing

