

At a Glance

What it is

- The Office of Naval Research (ONR) Integrated Topside (InTop) is an integrated, multifunctional, multibeam topside aperture construct that has a modular, open radio frequency (RF) architecture; software-defined functionality; and synchronized and optimized RF functions for electromagnetic interference mitigation.

How it works

- RF functions simultaneously share apertures and signal processing through the use of a central resource allocation manager. Requests for resources to accomplish various radio frequency functions (e.g., radar, electronic warfare (EW), communications) are prioritized, then resources are assigned to accomplish the function. The topside is continually optimized to meet the highest priority needs at any given time.

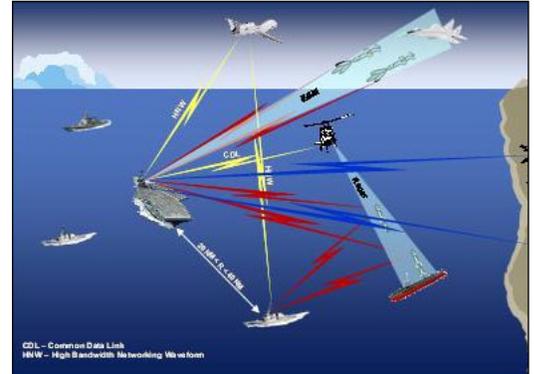
What it will accomplish

- The effort will allow multiple, simultaneous surface-to-air links without taking up valuable topside real estate aboard ship. The program will afford the fleet a cost-competitive solution with the use of multiple dish antennas while also facilitating integration of flat panel arrays into topside structures.

Point of Contact

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InTop is an Innovative Naval Prototype program that will develop a scalable family of EW, radar and communications capability to support multiple classes of ships and other Navy platforms. InTop will use a modular, open RF design to facilitate best-of-breed technology and cost-effective upgrades.



The vision for InTop is to dominate the RF spectrum, enable innovation through an RF open architecture (hardware and software) and create affordable systems that are scalable across platforms.

The plan is for InTop to reduce topside apertures present on Navy ships through the use of integrated, multifunction and multibeam arrays. In the past, the topside design approach was based on developing separate systems and associated antennas for each individual RF function, leading to a significant increase in topside antennas. This increase has led to problems with electromagnetic interference, radar cross-section and the overall performance of critical ship EW and communication functions.

The InTop program has indefinite delivery, indefinite quantity contracts with 18 qualified industry partners. These contracts cover full system capability development, niche capability development and systems integration. These contracts allow the acquisition community to purchase initial production units of InTop-developed technology for implementation in combat systems.

To date, the InTop program has completed six study contracts regarding surface ship EW, information operations (IO) and communications systems. The outgrowth has been the award of two contracts in 2010 for development of an Integrated EW/IO/Communications Advanced Development Model for use in the Surface Electronic Warfare Improvement Program Block III. A separate contract for the development of a wideband Submarine Satellite Communications Antenna System was awarded in early 2010. In late 2011, a single contract was awarded for the InTop Low-Level Resource Allocation Manager and Infrastructure Development. Additional contracts in other functional areas are forthcoming.

Research Challenges and Opportunities:

- Develop electronics technology to improve linearity and efficiency while reducing noise, size, weight and cost
- Develop multifunction, multi-band, multi-beam wide-band arrays capable of electronic warfare, communications and radar functions
- Develop a set of interface standards to be used throughout industry to allow integration and upgrades by multiple vendors