



# Combating Terrorism Technology Support Office Explosive Ordnance Disposal/Low Intensity Conflict Program Technical Brief



## ARVCOP

(Augmented Reality Visualization of the Common Operation Picture)

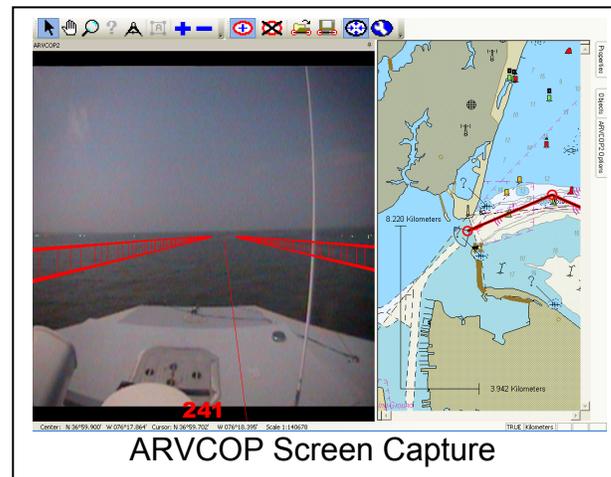
**Background:** Information Assurance/Situational Awareness is cited as absolutely essential by numerous commands. ARVCOP was originally developed (with CTTSO/ EOD/LIC support) to facilitate small craft operations in coastal counter-mine operations involving a mix of command, manned, and unmanned elements. The system provides both navigational capabilities (charts, etc.) and tactical capabilities (Blue Force Tracking, messaging) to support mission objectives. It is currently installed on platforms including Riverine Assault Craft, RHIBs, large vessels (HSV-2 Swift), Amphibious Assault Vehicles (AAVs - operational on both land and water), and trucks. An iPhone/Blackberry variant is planned for release in the near future. The Augmented Reality component of ARVCOP overlays tactical and navigation information on live sensor feeds, significantly increasing situational awareness and reducing operator workload.

**Requirement or Problem:** Military operations as well as Federal, State and Local agencies have a need for a COP system for SAR (Search and Rescue) and tactical operations that integrates position location, map display, communications, and other data for use by command and control as well as individual deployed assets.

**Technical Description:** ARVCOP is an integrated, ruggedized system that provides 1 or 2 displays, a user interface, a core server, plus sensors including thermal, day/night camera, and GPS/orientation. The system is designed for installation on watercraft and/or land vehicles and is designed to easily integrate satellite sensor data or airborne data from RPVs. Included is all hardware and software except for communications hardware, which is integrated on a domain specific basis.

**Advantages & Limitations:** ARVCOP provides an integrated display that replicates what are normally separate applications, including Electronic Chart, Blue Force Tracking, Tactical Communications, and Sensor Management. In addition, the AR overlay has been demonstrated to improve operator performance by 342% while multitasking mission critical tasks (navigation, observation, communication).

**Characteristics Statements and Specifications:** The standard modular ARVCOP system includes three components, all powered by 9-32VDC: 1)



ARVCOP Screen Capture

Sensor Head consisting of thermal Imager, color camera, and GPS based orientation sensor. 12X8X6 inches, 9.9 lbs. 2) A sealed and weather proof Computer Core with watertight cables including serial, USB and Ethernet. 13.5X14.5X3.75 Inches, 17lbs. 3) Dual marinized displays which are high bright and include NVIS coating. 11X12X4 inches, 12 lbs ea.

**Test and Evaluation Results:** The most recent evaluation was performed June 21-23 in a Riverine training exercise on and around Cape Fear River, NC, this included both water and land based elements. Additional recent tests have also been performed under the ONR ARVCOP-AL program at the Amphibious Vehicle Test Bed (AVTB) at Camp Pendleton, CA. Older test data is also available upon request. Contact information is listed below.

**Acquisition and Support Pricing:** Typical installed cost including FLIR thermal sensor, precision location/orientation sensor, fully marinized server, and dual ruggedized displays is \$50K-70K . The majority of this for hardware, software license costs are <\$10K including charts/maps. Software license pricing in quantity fall to ~\$1K per unit at quantities above 1000. Field replacement of the top level components is supported, service contracts are available. The system is not currently GSA listed, but a standardized product (which will be GSA listed) is planned for release in the near future. An iPhone / Blackberry variant (when released) will cost substantially less.

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