

## Combat Survivor Evader Locator (CSEL) System

The Combat Survivor Evader Locator (CSEL) is a personnel locator system designed to provide survivor/evader location and two-way communication between survivor/evaders and rescue forces. It is designed to enable command elements and search and rescue forces to locate and maintain contact with CSEL-equipped personnel. CSEL is also intended to provide an interim survivor capability until fielding of the Joint Tactical Radio System (JTRS), a new system designed to provide seamless joint communications capability for a wide range of users (air, ground, and maritime). Fielding of JTRS will not likely occur until 2012.

CSEL is a complex aerospace command and control system that includes hand-held radios, unmanned base stations, and rescue center workstations. It relies on support from UHF satellite communications, the Secret Internet Protocol Router Network (SIPRnet), national systems, Search and Rescue Satellite Aided Tracking (SARSAT) system, and the Global Positioning System (GPS). The hand-held radio features line-of-sight UHF/VHF voice, beacon, GPS, and over-the-horizon data modes for worldwide coverage. The over-the-horizon segment includes four unattended UHF base stations that control satellite communication links with hand-held radios and interface with national assets, the SARSAT system, and Joint Search and Rescue Centers (JSRC) via the SIPRnet. The ground segment displays and prepares data burst messages for transmission to/from the hand-held radio via UHF base stations.

The Air Force Operational Test and Evaluation Center, Army Test and Evaluation Command, and Operational Test and Evaluation Force (the OTAs) conducted operational assessments in 1998 and 2001. The second operational assessment resulted in low-rate initial production approval for CSEL. The OTAs requested and received production radios for a multi-Service operational test and evaluation (MOT&E) beginning in 2003. A full-rate production decision is planned for 2QFY04. OSD- NII submitted a program budget decision to reduce production and continue development. The delay would allow the program to reach program requirements, but would unnecessarily delay production to do so. DOT&E does not support this program budget decision since it leads to fewer systems in the warfighters' hands without speeding or increasing capability.

### TEST & EVALUATION ACTIVITY

The following test activities occurred during FY03:

- February 2003, combined testing, Fort Bragg, North Carolina, to address operational effectiveness.
- April 2003, development testing, Fort Huachuca, Arizona, to validate system readiness for OT&E.
- May 2003, combined testing, Fairchild Air Force Base, Washington, to assess operational suitability (reliability).
- May 2003, combined testing, Kirtland Air Force Base, New Mexico, to evaluate operational suitability (maintainability).
- June 2003, MOT&E, Davis-Monthan Air Force Base, Arizona, an Air Force OT&E.
- July 2003, MOT&E, *USS John C. Stennis* (CVN 74) Task Force Exercise, San Clemente Island, California, a Navy OT&E.
- July 2003, MOT&E, Little Creek, Virginia, Navy operational test for Navy Special Operations Force (Seals).



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# AIR FORCE PROGRAMS

- August 2003, MOT&E, Exercise Desert Rescue, Naval Air Station, Fallon, Nevada, a multi-Service operational test and evaluation, joint and coalition interoperability.
- September 2003, combined testing, Hurlburt Field, Florida, water integrity testing.
- October 2003, combined testing, Fort Huachuca, Arizona, GPS jamming susceptibility.

## TEST & EVALUATION ASSESSMENT

The operational assessment conducted by the OTAs in 2001 determined CSEL to be potentially effective and suitable, but not ready for operational employment. The OTAs identified several areas that required corrective action prior to the start of MOT&E: Concept of Operations updates, battery improvements, training, manning requirements, ORD requirements, fielding plan, and communications infrastructure. The contractor subsequently announced that all system deficiencies generated from both operational assessments have been corrected. These fixes were validated during developmental testing in 2002. Because of software and integration problems with the new Selective Availability Anti-Spoofing Module, the contractor encountered difficulties in providing the requested numbers of production representative hand-held radios for MOT&E. The delays and the lack of hand-held radios caused the operational test agencies to reschedule MOT&E several times in 2002 and 2003.

CSEL was tested in joint and coalition environments, and integrated into end-to-end combat rescue scenarios with operationally representative survivor/evaders, Joint Search and Rescue Centers, life support, and rescue forces. While CSEL has made substantial progress in the past 18 months, there are still issues with employment concepts, training, hand-held radio data loading and maintenance, information assurance, batteries, and national asset support. The OTAs conducted MOT&E test events from June to October 2003 and are in the process of analyzing and reporting the results. MOT&E findings have demonstrated certain individual capabilities (radio function, message relay, JSRC receipt, etc.), but have had difficulty in showing total system capability in end-to-end tests that exercise all aspects of the CSEL system. Deficiencies have been identified in water intrusion and ground reference point calculations. Both are being re-tested in late 2003. DOT&E expects the evaluation to be complete before the end of the calendar year in order to support the Milestone review in March 2004.

The number of users requesting survivor radios continues to grow. Survivor radio needs cannot be met with just one system (either PRC-112 "Hook" radios or CSEL). The Personnel Recovery Advisory Group recommended immediate efforts to provide capabilities with both systems. They recommend immediate implementation of an over-the-horizon capability for PRC-112 (which CSEL has, but Hook lacks) and terminal area guidance for CSEL (which Hook has, but CSEL lacks). The goal of both efforts is to provide a wide-ranging interim capability for survivor communications until the implementation of JTRS. DOT&E supports these recommendations and also recommends follow-on operational test and evaluation of Hook and CSEL. The follow-on operational test and evaluation must conduct end-to-end testing of each system in its respective operational environment. Evaluation of these results will provide the user with the best picture of Combat SAR communication capabilities, and assist combatant commanders in choosing the appropriate system for their use. DOT&E is nominating the PRC-112 radio for the oversight list in order to support this evaluation.