



Tri-Service Offboard Countermeasures

Classification: Three days Unclassified
Instructor: Dr. Arthur Self

Course description

This important technical seminar reviews the concepts and issues surrounding tri-Service platform protection using Offboard Countermeasures [Chaff, IR, Active ECM] in today's multi-national, multi-force scenarios.

Attendees will be taken through a detailed understanding of roles, applications, deployment issues and technology capabilities.

Once performance requirements have been derived, a comprehensive review will be made of existing offboard CM products and ongoing technology programs culminating in some projections on future directions (eg cost, technology).

Emphasis is on showing practical performance requirements and issues as well as subsequent effectiveness measures.

Also included is a demonstration of state-of-the-art simulation software of latest missile/CM concepts.

Lessons learned from a variety of previous conflicts are also reviewed. Critical issues in the seminar will be illustrated with realistic examples on how Offboard CMs have supported Tri-Service operations.

An extensive database of platform data, sensor/weapon fits is included for subsequent in-depth reading.

Who should attend?

EW engineers, payload designers, and Army/Air Force/Navy service personnel will all benefit from this in-depth technical seminar on Offboard CM.

Derived formulae and worked examples will enable attendees to define and establish requirements and effectiveness of a wide range of CM concepts.

'OFFBOARD COUNTERMEASURES'

DEFINITIONS & FORMULAE

- Expendables [EJ] – definitions; examples of key types; adv/disadv vs. large ECM
- Performance/Effectiveness formulae - Radar, Chaff, Communications, IR
- Propagation issues

PLATFORM CHARACTERISTICS, ROLES AND APPLICATIONS

- Ship, Aircraft and Armoured Vehicles
- Radar/IR cross-sections
- Appreciation of electromagnetic environments (EMEs)
- Types of ECM vs. emitter type
- Naval Roles and Applications
- Land Roles and Applications
- Air Roles and Applications
- Recent Conflicts and use of Offboard CMs

CM PERFORMANCE REQUIREMENTS

- Army Scenarios
 - Radar EJs
 - HF/VHF Comms EJs
 - Tank/helo protection
- Naval Scenarios
 - ASM decoys (radar, IR)
 - ARM decoys
- Air Scenarios
 - SAM/AAM decoys
- Comparison - Air/Naval platform Self protection

DEPLOYMENT CONSIDERATIONS

- Aircraft Scenarios
 - Towed/Offboard
 - Timelines
- Tank/helo Scenarios
 - hand emplaced vs. RPV vs. artillery delivered
 - radar EJs
 - communications EJs

- area coverage requirements
- ATGW timelines

- Ship Scenarios
 - Offboard EJs
 - Timelines

CM EFFECTIVENESS

- Onboard ECMs
- Naval EJs
 - J/S and effectiveness (radar, chaff, IR)
 - measures of effectiveness (MOE)
 - layered defense concept (hardkill/softkill)
- Aircraft EJs
 - effectiveness calculations
 - towed decoy parameters
 - MOEs
- Army EJs
 - effectiveness calculations (radar, chaff, comms)
 - MOEs – '*circles of effect*'
- **Stealth** and EJ Impacts

COST AND OTHER ISSUES

- Scenario related : deployment time, main beam vs. side lobes, platform maneuver, etc
- Future threats and environments
- Cost (incl. recent US study)
- Coordination/integration
- New integrated programs (SLY-2V, SSDS, CEC, SIRFC, SIIRCM, DIRCM, etc)

CURRENT EXAMPLES AND PROGRAMS

- Offboard CM product overview
- Aircraft EJs (POET, GEN-X, STRAP, AAED, TALD, MALD, TRD, ARIEL, etc)
- Naval CMs (NULKA, SIREN, HIRAM, GEMINI, LURES, EAGER, FLYRT, etc)
- Army CMs

- Communications (hand; gun; rocket)
- Radar (hand; remote)
- IR/smoke
- UAVs (PIONEER, CL227, OUTRIDER, MUAUV, PHOENIX, etc)

FUTURE DIRECTIONS

- Technologies Areas - RF, Antennas, ASICs, GaAs, COTS opportunities, Tx (power tubes,

solid state, superconductivity, etc), Fiber optics, Processing, etc

- Sensor advances
 - Radar (MFR; ANTI-Stealth)
 - MMW, LPI, SEI/HULTEC, EO/IR, etc
- Weapon advances
 - Hard kill and Soft kill
 - Directed Energy Warfare (Lasers, HPM, CPBW, etc)
 - SHORTSTOP (SEPS) system
- EW database issues