OFFBOARD PASSIVE AND ACTIVE DECOY PROGRAM UPDATE

PRESENTATION TO THE AOC RSA CHAPTER – MINI-CONFERENCE AT IMT

PRESENTER: LLEON DOWNES
DATE: 22 MAY 2014
IS THERE AN ASM THREAT?

EXAMPLE:

AHI-HANIT SAAR5
14 JULY 2006
PAIR OF SILKWORMS
LAUNCHED BY HIZBOLLAH

C802 SILKWORM
Major Decoy Developments

- MASS – Multi Ammunition Softkill System

This system shows main features of typical advances made in decoy systems

- Christoph Bormann - Naval Softkill Systems

- RHEINMETALL DEFENCE
Missile Threat 2000 – 2030
(courtesy of Rheinmetall)

- **TV**: 0.4 – 1.0 µm
- **Imaging IR**: 3 – 13 µm
- **Radar**: 8 – 18 GHz
- **Laser**: 0.55 – 1.5 µm
- **SACLOS**: 0.4 – 13 µm
- **SAM**: 1.5 – 5 µm
- **MMW**: 35 + 94 GHz

**Note:**
- ARMSCOR
- Gateway to Defence Solutions
MASS RCS Effect (courtesy of Rheinmetall)

Deployment without shadowing effects
MASS Effectiveness against Edge Detection (LET ASM) (courtesy of Rheinmetall)
LASER GUIDED

Courtesy of Rheinmettal
WHAT IS AN OFFBOARD ACTIVE DECOY?
OFFBOARD ACTIVE DECOY

AN ACTIVE OFFBOARD DECOY IS A DECOY WHICH IS USED TO SEDUCE AN INCOMING ANTI-SHIP MISSILE AWAY FROM ITS INTENDED TARGET (THE SHIP) BY ACTIVE RADIATION

AN ACTIVE DECOY IS ONE WHICH ACTIVELY TRANSMITS RF ENERGY TO INTERFERE WITH THE MISSILES TRACKING SENSOR
“DECOYS PROVE HIT IN MISSILE DEFENCE”

JANE’S NAVY INTERNATIONAL – DEC 2008

NULKA – JOINT DEVELOPMENT BAE SYSTEMS AUSTRALIA AND SIPPICAN SYSTEMS USA

FITTED TO OVER 100 US WARSHIPS, AUSTRALIAN ANZAC FRIGATES AND CANADIAN DESTROYERS

SIREN ACTIVE DECOY ROUND (ADR) – UK ROYAL NAVY – FITTED TO FRIGATES, DESTROYERS AND INVINCIBLE CLASS CARRIERS

ISRAELI C-GEM HAS BEEN PROTOTYPED AND TESTED - INSTALLATION UNKNOWN
ACTIVE OFFBOARD DECOY CONCEPT

TARGET ECHO

RECEIVED RADAR SIGNAL

MISSILE RANGE GATE
ACTIVE OFFBOARD DECOY CONCEPT

TARGET ECHO

RECEIVED RADAR SIGNAL

MISSILE RANGE GATE

DECOY SIGNAL

MISSILE RANGE GATE

MISSILE TRACKING DECOY

MISSILE RANGE GATE
ACTIVE DECOY REQUIREMENTS

- SUFFICIENT GAIN AND POWER
- PULSE FIDELITY AND COHERENCE
- MIMIC SHIP MOTIONS
- MULTI-THREAT CAPABILITY
- RAPID REACTION TIME
- LOW COST
Coastal batteries launch three anti-ship missiles, targeted by coastal surv
PROGRAM OVERVIEW

LAB TEST

ACTD INTEGRATION PHASE

INTEGRATED TEAM ENVIRONMENT (IMT)

FLIGHT PLATFORM INTEGRATE

RF PAYLOAD INTEGRATE

ACTD TEST & EVALUATION

FLIGHT PLATFORM INTEGRATE

LAND TRIALS

SEA TRIALS

PROGRAM GOAL

ACCEPTABLE TECHNOLOGY RISK REDUCTION TO COMMENCE ACQUISITION PHASE
DECOY ACTIVE RF PAYLOAD HISTORY

THE PAYLOAD IS BASED ON THE CONCEPT OF AN ACTIVE BROADBAND REPEATER
SEA TRIALS – RF PAYLOAD JUNE 2012

PLAN VIEW OF TRIAL GEOMETRY

DECOY VESSEL
TRIAL TRAJECTORY

DECOY VESSEL
WITH OAD MOUNTED

TEST RADAR

RANGE – 10km

TARGET WITH 6000m2
CORNER REFLECTOR
POINTING TO RADAR
- STATIONARY

400m
100m
TARGET POSITION AT 9700M

DECOY

DECOY PULSES

CLUTTER SUPPRESSED

NO JAMMING DECOY PULSE NOT IN RANGE GATE

SEA CLUTTER

RANGE GATE TRACKING DECOY NOTE: RANGE CLOSING

RANGE GATE PULL-IN
SCREEN GRAB OF AREA OF PLOT EXTRACTED NAVIGATION RADAR

SEALAB RETURN | 1ST DECOY PULSE | 2ND DECOY PULSE | 3RD DECOY PULSE

TARGET RETURN
CURRENT QUAD-ROTOR DESIGN

UNIVERSITY OF STELLENBOSCH
TRIAL PLAN SHOWN GRAPHICALLY

- Starting Point
- Hover Point (5 seconds)
- Radar

Distances and Angles:
- 150m at 18° from Starting Point to Hover Point
- 310m from Hover Point to Radar
45° Yaw step
ONBOARD COMPUTER SYSTEM AND CONTROL ELECTRONICS BEING UPGRADED

CAMERA BEING CO-LOCATED WITH ANTENNA
RF PAYLOAD DEVELOPED AND TESTED IN A NUMBER OF CONFIGURATIONS

SIMPLE COHERENT REPEATER WITH OPTICAL DELAY LINE CHOSEN

FLIGHT PLATFORM ENVELOPE TESTING SUCCESSFUL

UPGRADING THE FLIGHT PLATFORM

FURTHER LAND AND SEA TESTING TO COMMENCE
THE TECHNOLOGY RESEARCH PROGRAM HAS SHOWN THE VIABILITY OF AN ACTIVE RF DECOY FOR COUNTERING RADAR GUIDED ASMS

THERE IS STILL A HUGE STEP BETWEEN DEVELOPING AN ACTDM AND REACHING THE STAGE WHERE IT IS A RELIABLE PRODUCT

THE THREAT NEEDS TO BE CLEARLY UNDERSTOOD
NEW PALE CHANTING CROW?