



SAAB

BOZ-EC **ENHANCED** POD WITH CM AND MAW



BOZ-EC ENHANCED CAPABILITY



Tornado with BOZ-EC dispensing

BOZ-EC is a highly effective countermeasures pod for high performance aircraft. It has extended pre-emptive dispensing capacity, missile warning and flare cocktail capability. All this Enhanced Capability has been incorporated into a BOZ pod, which is operational on the Tornado aircraft in four nations. Using the battle proven BOZ pod provides for lean aircraft integration.

TECHNICAL DESCRIPTION

BOZ-EC is an implementation of the Saab CIDAS-100 Compact Integrated Defensive Aids Suite in the BOZ pod.

The countermeasures dispensing is characterized by the flare cocktail capability, designed to defeat all modern IR-guided threats. The dispensing system also caters for chaff dispensing.

The pod contains five, or more, pyrotechnical dispensers of type BOP-L-39 and a Missile Approach Warning (MAW) in the aft section. The dispensing can be performed forward/downwards, sideways in two adjustable directions. The pod can be mounted on either side of the aircraft.



Tornado with BOZ-EC pod

MAJOR COMPONENTS

EWC-100

The Electronic Warfare Controller (EWC-100) hardware and software performs the following independent functions;

- Defensive Aids Control.
- Missile Approach Warning Analysis.
- Decoy Dispensing.

MISSILE APPROACH WARNING FUNCTION, MAW-300

The MAW module consists of 4 sensors and a processing card in the EWC-100. Each sensor is an optical staring sensor that reports the azimuth, elevation and amplitude characteristics of the most prominent UV sources in its Field Of View (FOV) to the EWC. Each sensor has a 110 degrees conical FOV. The EWC performs the Built-In-Test control and management of the MAW sensors. The MAW Analysis consists of dedicated hardware and software functions that receive the processed data from the sensors. Tracks are formed from the sensor data and are evaluated based on their temporal irradiance and spatial modulation characteristics. If the track is

classified as an emission originating from a missile on a converging flight path, a MAW alarm is issued. Missile alarms are transferred to the Defensive Aids Controller for display and countermeasures management purposes.

DEFENSIVE AIDS CONTROL FUNCTION

The Defensive Aids Controller performs the high level integration, management and control of the sub systems as well as external interfacing to the avionics systems. Alarm data is received from the aircraft warning sub system. Weapon systems matching and management is performed based on the User Data File (UDF) data. Control unit outputs are generated and countermeasures responses are assigned based on weapon system identification and priorities as defined in the UDF. A central data record function is also managed by the Defensive Aids Controller.

DECOY DISPENSING FUNCTION

The decoy dispensing function consists of dedicated hardware and software functions that interface to and manage the BOP and ED (option) dispensers. Countermeasures

patterns and sequences are stored and initiated via Defensive Aids commands. Payload data, mode data and dispensing data are transferred to the Defensive Aids Controller for control unit indications.

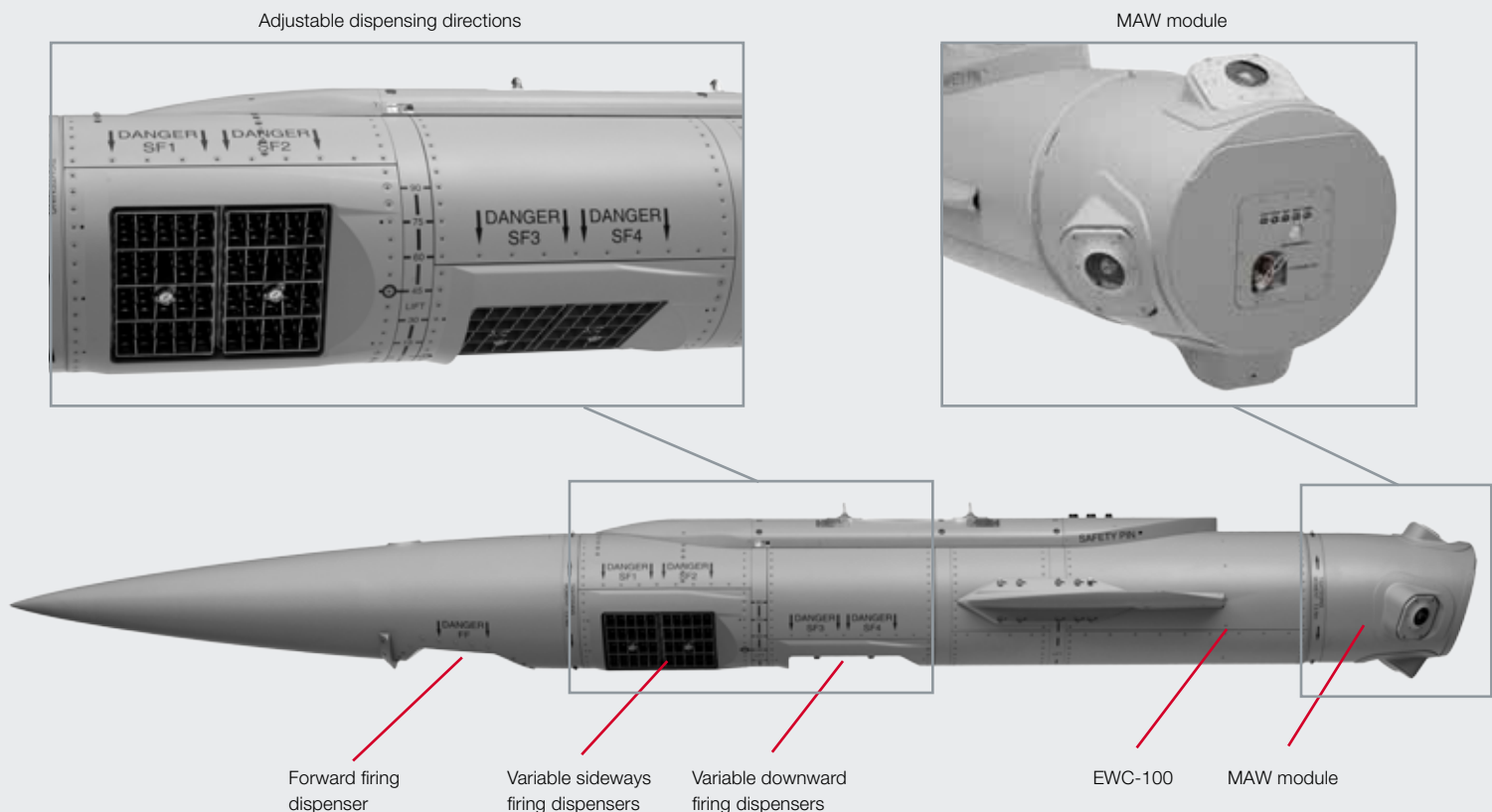
COUNTERMEASURES DISPENSER, BOP-L-39

The BOP-L-39 is a light weight pyrotechnical dispenser holding 39 1"x1" or 19 2"x1" standard 8" long payloads. The dispenser is fully integrated with the EWC-100 functionality and provides for misfire detection and compensation, intelligent magazine recognition and very quick loading thanks to its unique built-in, tool-less magazine locking mechanism.

The minimum time between two firing pulses from a single BOP-L is 10 ms.

DISPENSER OPTIONS

It is possible to install two more BOP-L-39 dispensers or one ED dispenser in the aft section for pre-emptive IR protection.



AIRCRAFT INTERFACE

GENERAL

BOZ-EC mechanical and electrical power interfaces are identical with the legacy BOZ pod. The aerodynamic properties, verified through wind tunnel and flight testing, are similar to those of the legacy BOZ which further facilitates aircraft integration.

Furthermore, the electric and datalogic interfaces are also identical with the legacy BOZ pod, with extensive cockpit Human Machine Interface functions to maximize aircrew situational awareness.

The BOZ-EC can also be integrated with MIL-STD-1553 or RS-422 data links to adapt to other displays and control means.

HUMAN MACHINE INTERFACE, HMI

The HMI is based on the legacy BOZ control panel, including the following functions: safety logic switches, dispensing mode change, initiation of manual dispensing programs, remaining stores indication, alarm annunciation and built in test indication.

MODES OF OPERATION

The BOZ-EC has the following dispensing modes: AUTOMATIC, SEMI-AUTOMATIC and MANUAL.

Manual initiation of dispense programs can be performed at all times.

Backup dispensing can be performed as part of a graceful degradation philosophy, should parts of the system fail.

INDICATIONS

MAW generated THREAT ALARMS can be indicated on the legacy control panel.

BUILT-IN-TEST results are indicated on the control panel on a high level while in-flight and with line replaceable unit resolution while on the ground.

REMAINING LOAD is displayed on the legacy control panel.

JETTISON

It is possible to jettison all remaining load from the BOZ-EC pod using the legacy BOZ control panel.

CONTROL UNIT OPTIONS

The BOZ-EC pod provides for future growth in terms of aircraft interface using MIL-STD-1553, RS422 data links discrettes and audio interface. The pod can therefore interface to virtually any display or control means.

DATA

- Probability of Warning, POW, is >99 %, provided the threat is within the field of view coverage of the MAW module.
- Response time, time to impact, has been optimized for the use of reactive pyrotechnic countermeasures while maintaining a low false alarm rate.
- Data logging is provided for through recording of processed declared missile events, built-in-test and inertial navigation data.
- Countermeasures dispensing:
The forward section BOP-L-39 pyrotechnical dispenser is oriented with a depression angle of 40 degrees firing downward/forward. The mid section four BOP-L-39 pyrotechnical dispensers can be adjusted for $\pm 90^\circ$ sideways dispensing related to the downwards position. The forward part of the mid section contains two BOP-L-39 dispensers. They are oriented as a pair to fire sideways or downwards, the firing angles to be set pre-flight in steps of approximately 7.5 degrees in workshop. The rear part of the mid section contains the other two BOP-L-39 dispensers. They are also oriented as a pair to fire sideways or downwards, the firing angles to be set pre-flight in steps of approximately 7.5 degrees in workshop.

GROUND SUPPORT

- The BOZ-EC pod has a Ground Support Interface that provides for ground crew built-in-test indication, power indication, ground based end-to-end testing, initiated built-in-test and an Ethernet based data port.
- The legacy BOZ PHATE Test Equipment can be used with the BOZ-EC pod in its plug and play configuration.
- A Chaff Flare Test Block (CFTB) emulating a loaded magazine can be used for ground testing of dispensers.
- A Zero Volt Tester can be used to make sure no voltage is on the dispenser during loading.
- A Tool to Generate User Data Files, e.g. dispensing program, can be used to adapt to mission characteristics.
- A Data Loader tool can be provided to upload to the pod User Data Files containing e.g. dispense programs.
- A tool for Post-Mission Analysis, e.g. mission flight route, inertial navigation data, threat data, dispensing activities, can be used to analyze recorded mission data.