Virtualabs

DRIAC – A
(Digital Radar Intercept And Countermeasures - Airborne)

1- Generals

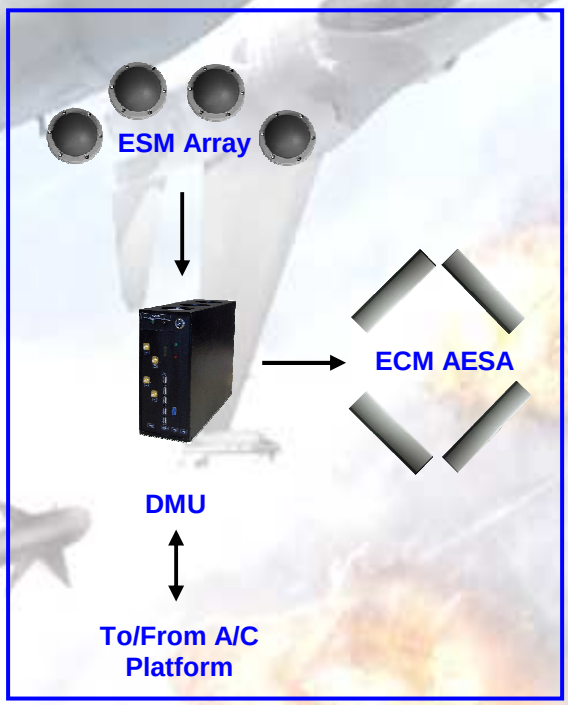
DRIAC-A is a new Digital Integrated EW System capable of providing very advanced performances by exploiting very few SW controlled electronic modules, so being able to meet the changing requirements of the modern airborne environment in a very cost effective way.

DRIAC-A can be provided for fighters or for helos / transport aircrafts.

Beside the features of an advanced digital ESM, DRIAC-A is capable of producing both Self Protection Jamming (SPJ) and a very effective Electronic Attack Jamming (EAJ) in a very wide frequency band. EAJ is very useful in airborne operations because it facilitates the platform penetration in a hostile territory.

2- DRIAC-A Main Features

- Both high sensitivity and high POI over the whole RF range
- Extremely high sensitivity in any 2 GHz band of interest
- High Dynamic Range
- High Traffic handling (Pulsed and CW)
- Interferences immunity thanks to the right design
- Very accurate (ELINT class) and reliable measurements (DOA, Frequency, Frequency Law, PW, MOP, PRI, PRI Law, ASP, Amplitude)
- Fully integrated Countermeasures
- Multithreats capability (up to 4 multibits DRFMs)
- Low Weight, Volume and Power Consumption
- Low production cost and simple Installation



The fulfillment of the conflicting requirements of an ESM (a high sensitivity together with a high POI) overcomes the main limitation of most of the presently available systems.

Moreover, the real-time and accurate channellisation allows both accurate measurements in a very high traffic conditions and a very high robustness to interferences in extreme conditions.

3- DRIAC-A Architecture and Composition

DRIAC-A is composed of two sections: the Passive (ESM) and the Active (ECM)

Passive section (ESM)

The ESM has the capability to instantaneously cover the whole frequency range of interest (e.g. 2 – 18 GHz) and, at the same time, to perform detection and measurements at high sensitivity, thanks to the exploitation of the following main modules:

- A proprietary **Front-End (IFR, Instantaneous Frequency Router)**, able to instantaneously convoy all the traffic present in the e.m. environment in the wide IF band (2 GHz) of the following Digital Receiver.

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- A proprietary **Dual DRX Module (DDRX)**, composed of two 2 GHz IBW Digital Receivers (DRX), which provides a continuous real-time "Spectrum Analysis" on the whole operational e.m. spectrum. Moreover, the DDRX Module hosts a proprietary Very Fast Processing which grants the exploitation of the DRX as the main measurement device to produce, at the required very high sensitivity, extremely accurate PDMs associated to all the received signals, even if overlapped in time.

- A **Sorter & Jamming Program Module (SJP)**, following the DDRX Module, which processes the PDMs stream in order to detect all present emissions and to analyse them providing an accurate description of their characteristics.

The ESM section inputs are provided by the:

- **ESM Antennas Array**
  The ESM array is composed by four pre-amplified log-p antennas working in the frequency band from 2 to 18 GHz.

Active section (Countermeasures)

When an emission is designated for Jamming, the DDRX is instructed to load the **DRFMs**, implemented in this Module, with the proper emission signal samples.
Then, a **Digital Modulator,** present in the SJP Module, takes care of the digital generation of the Jamming Technique to be applied as well as of the base band conversion via a fast Digital to Analog Converter.
Finally, the base band jamming signal is converted to the appropriate RF band by an **Up-Converter Module** and transmitted by means of the ECM Antenna set composed by two sets of Jamming AESA: the Low Band (2-6 GHz) and the High Band (6-18 GHz). The standard ECM Antenna configuration is composed by:

- **2 or 4 HB Jamming AESA (6 - 18 GHz)**
  The wide band AESA Jamming Antennas (one/two for the front sector, and another one/two for the rear sector) are composed of a small effective planar AESA, each one covering 90 deg azimuth.

Excluding the Antennas, the above modules (Passive and Active sections) are housed in a **Digital Main Unit (DMU)** which also houses a **CPU Module** (having the tasks of the Emitters Identification, DRIAC-A management and Platform Interface) and the **Power Supply**.

4- DRIAC-A Performances

Passive Section (ESM)

Architecture	Wide Open Channellised
RF Instantaneous Bandwidth	2 -18 GHz
POI	100 %
Max Receiver Sensitivity	Very high (Sensitivity can be programmed as a frequency function)
On board Compatibility	granted by the high Dynamic Range and by SW algorithms
Traffic	> 1 Mpps and CW signals
Emitters type	Pulsed, MOP, CW
Tracked emitters	256
DOA accuracy	"Amplitude DOA + "Phase DOA" (in 2-18 GHz) option: "Amplitude DOA + "Delta TOA
Emitters detection	Digital Automatic Extractor

Active Section (Countermeasures)

ECM Frequency Coverage	6- 18 GHz and 2-6 GHz, as option
Angles Coverage	360° Azimuth & 30° Elevation (ty pical)
Multi-threats	4+4
Jamming Techniques	Programmable and suitable for SPJ and EAJ
Weight and Power Consumption	15 Kg, 1500 W