Counter Measure Dispensing System for missile's imaging and infrared seeking

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***Abstract*—Counter Measure Dispensing System (CMDS) is a gadget fitted in the Warrior Airplanes to keep the flying machine from the adversary approaching rockets. The capacity of CMDS is to initially distinguish the approaching rockets and show it in the MFD (Multi-function display) which the pilot can see by sitting in the cockpit. There are two sorts of rockets: - IR rockets that takes a shot at the rule of Warmth Detecting and the other one is the Radar Looking for Rockets. To redirect the IR rockets, flares are utilized. Flares are only white-hot magnesium which produces tremendous warmth equal to the motor warmth of the airship when interacting with the climate. Teases delivers an arrangement of aluminum-pellets mists which befuddles the rocket lastly the airship is spared from the adversary rocket zone. This methodology can be taken care of by the CMDS gadget. CMDS can be worked either by physically or consequently. For the manual method, the pilot can press the launch catch by choosing the measure of flares and teases to be apportioned. For the programmed dispensing, a program must be composed so the required number of flares and teases will be launched out from the airship contingent on the force of the approaching rocket. The essential capacity of CMDS is to distinguish and recognize the sort of approaching rocket. It needs to show to which side of the aero plane the rocket will hit. This must appear in the four-quadrants of the MFD screen to the pilot who is sitting in the cockpit. The radar reenactment should be possible by utilizing a programming stage called MATLAB and Simulink. With the assistance of GUI (Graphical UI), we can acquire a screen with a diagram of four quadrants and a radar recognizing pin (line) which will turn constantly to check the approaching rockets.**

Keywords—CMDS, Flares, MFD, IR missiles, Heat missiles

I. INTRODUCTION

The CMDS gives an incorporated, risk versatile, reprogrammable, PC controlled capacity for apportioning nonessential baits. These incorporate refuse, flares, Radio Recurrence (RF) expendables and others. The CMDS framework upgrades airplane survivability in modern danger conditions. The framework is intended to give the capacity of programmed or pilot directed reaction, and works alone or in a joint effort with different countermeasures guarded frameworks to overcome Air Interceptor (AI), Hostile to Air ship Mounted guns (AAA), and Surface-to-Air Rockets (SAMs). The CMDS replaces the maturing A/Beer 39 CMDS on-board an assortment of airplane. This substitution is being expert on a one-for-one premise without any effects to existing aircrew and authoritative level keeping an eye on prerequisites. Middle of the road level upkeep for the CMDS is presently incorporated inside the United Robotized Bolster System (CASS) program. Arms labor levels required to help the CMDS are met through the general host stage prerequisites. Arms preparing is directed by means of stage preparing pipelines and appropriate Weapons Schools for confirmations.

II. SYSTEM DESCRIPTION

1.Operational Uses:

The AN/ALE- 47 CMDS gives beneficiary flying machine a programmable, PC controlled ability for administering extra counter measures ,counting flares, debris, non-programmable disposable jammers, and programmable jammers. The framework is intended to, process contributions from on-board Electronic Fighting (EW) sensors and naturally select and apportion the fitting countermeasures to overcome a recognized risk .The motivation behind the CMDS is to expand the survivability of F/A-18C/D/E/F, F-14B/D, AV-8,EA-6B, P-3C, KC-130F/J/R/T, MV-22, HH-60H, SH-60R, VH-60N, VH-3D, AH-1Z, UH-1Y,CH-46E, CH-53E, and MH-53E air ship in different danger conditions.

2. Foreign Military Sales:

The U.S. Air Force is the Department Of Defense (DoD) lead development and procurement agent for the AN/ALE47. All Foreign Military Sales (FMS) are handled through their respective U.S. counter service department.

III. PHYSICAL DESCRIPTION

The CMDS uses present day processing technology to function computerized threat adaptive meting out of expandable counter measures. It is successful of shelling out flares, Chaff, Radio frequency decoys, and will be capable to accommodate future expandable. The weapon Replaceable Assemblies (WRA) of CMDS gadget consist of the following modules fitted to the aircraft.

Table 1 shows the different equipment's that are present in the aircraft. The approximate size and weight of the individual CMDS Components are as follows:

EQUIPMENT	LENGTH	WIDTH	HEIGHT	WEIGHT
Dispenser (D-56 or D-63)	8.9 in.	9.13 in.	5.98 in.	3.90 lbs.
MFD	7.00 in.	6.00 in.	3.85 in.	4.90 lbs.
Sequencer	4.98in.	7.02 in.	2.91 in.	4.05 lbs.

Magazine (MX-11599)	6.36 in.	9.40 in.	7.67 in.	5.99 lbs.
Programmer	6.75 in.	3.65 in.	6.14 in.	4.50 lbs.
Digital Sequencer Switch	6.00 in.	4.00 in.	2.80 in.	1.60 lbs.
Safety Switch	5.01 in.	3.63 in.	3.55 in.	1.90 lbs.

Table 1 Equipments in the Craft

Programmer plays out all the rationale capacities important to choose and execute administer programs. It interfaces with the Control Display Unit (CDU) or the Computerized Control Display Unit (DCDU), the sequencers or advanced sequencers, and on-board EW frameworks. One software engineer is introduced in every beneficiary air ship.

Multi-Functional Display permits the operator to reveal and manage CMDS features along with selection of the mode, program and inhibiting. The F/A-18 and MV-22 platforms make use of existing on-board controllers and indicators vice the MFD. If applicable, one MFD is hooked up in the cockpit of the host aircraft.

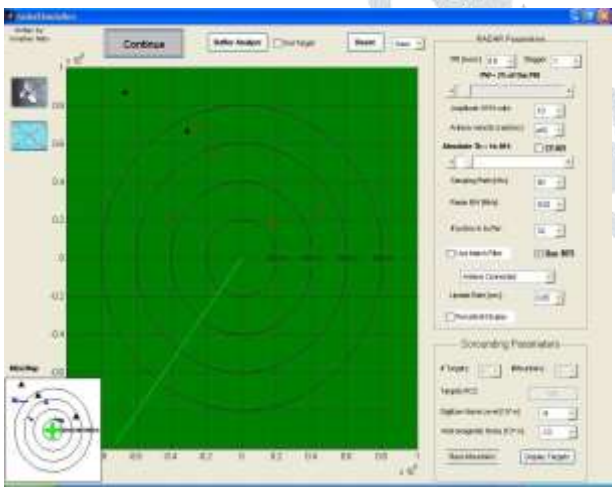

Figure 1 Simulation of CMDS in MATLAB

Sequencer switch generates and routes firing signals payload locations and continues magazine inventory. Up to 16 sequencer switches can be mounted on every aircraft, which can interface with one or two dispenser assemblies.

Digital sequencer switch produces and courses terminating signs to particular payload areas and keeps up the magazine stock. Up to 16 advanced sequencer switches can be introduced on every air ship. Each advanced sequencer switch interfaces with one container get together. The computerized sequencer switch is utilized just on stages into which the CMDS has been retrofitted.

Dispenser the magazines and transmits a terminating sign to stores in the magazine. The Naval force utilizes an assortment of I-4 containers including the D-56 and D-63. There are a couple of allocators for every sequencer that are accessible in different arrangements on-board the host flying machine.

Magazine provides for carriage of the counter measure Expendables. The AN/ALE-47 CMDS is compatible with a variety of Navy magazines.

Safety Switch inhibits the dispensing of payloads by interrupting electrical power.

IV. FUNCTIONAL DESCRIPTION

1. Procurement.

The U.S. Air Force is the DoD lead development and procurement agent for the CMDS. All FMS are handled through their respective U.S. counter service department.

2. New Development Introduction.

The CMDS began fleet introduction as new production equipment in FY96 for F/A-18C/D (Lot XVIII through XXI), F/A-18E/F, P-3C, KC-130J, MV-22, AH-1Z, UH-1Y, VH-3D, HH-60H, VH-60N, and SH-60R aircraft. A fleet retrofit program also begins in FY01 for F-14B/D, EA-6B, F/A-18C/D (Lot XII through XVII), AV-8, CH-46E, CH-53E, MH-53E, and KC-130F/R/T aircraft. The AN/ALE-47 retrofit program is such that the system can be either internally mounted as stand-alone or fully integrated with other on-board EW and avionics systems. The CMDS composition is tailored to the requirements of the host aircraft.

3. Significant Interfaces.

The CMDS is capable of interfacing with the host aircraft Radar Warning Receiver (RWR), Missile Warning System (MWS), and on-board jammers via the 1553 electronic data, avionics, and EW mux buses and a full duplex RS-422 serial data link.

A. Concepts

1. Operational Concept.

The CMDS can provide operators with the option of automatic, semi-automatic, or manual dispensing. Control during flight is accomplished by the aircrew in accordance with the host platform Naval Air Training and Operating Procedures Standardization (NATOPS) Manual, secret supplement. The following six modes of operation are available with the CMDS.

2. Maintenance Concept.

Maintenance of the AN/ALE-47 CMDS is performed by organizational, intermediate, and depot level technicians. The dispenser assemblies and magazine are maintained at the organizational and intermediate levels only. The safety switch

is an organizational level consumable item. The remaining WRAs are repaired at all three maintenance levels. The AN/USM-636(V) Consolidated Automated Support System (CASS) is used to support the AN/ALE-47 at the intermediate level.

The CMDS maintenance plan provides a detailed description of the authorized electronic component repair procedures. The expendables and impulse cartridges associated with the AN/ALE-47 require inspection prior to use, loading, handling, and repackaging at the organizational and intermediate levels. These maintenance tasks are identified/assigned by the Naval Ordnance Maintenance Management Program (NOMMP).

MODES	SYSTEM DESCRIPTION
Automatic	System determines appropriate response based on threat environment without aircrew intervention
Semi-Automatic	System determines appropriate response based on threat environment with aircrew initiation
Manual	Aircrew selects and initiates preprogrammed responses with up to six selectable manual programs
Bypass	Aircrew has direct link to the sequencer for dispensing in the event of a programmer or CDU failure (no inventory display while in this mode)
Jettison	System rapidly dispenses all payloads marked as Jettisonable in the MDF (typically this includes all flares)
System BIT	Power Up BIT (PBIT), Continuous BIT (CBIT), and Initiated BIT (IBIT) available

Table 2 Types of dispensing systems

V. CONCLUSION

Now a days every country is striving hard for preserving its glory and growing its protection from developed and effective countries. One of the fundamental forces for assisting a nation's protection is air space. The Air Force, is in the broadest sense, the nation's military branch that chiefly conducts aerial warfare. More specifically, it is the branch of a nation's armed services that is responsible for aerial warfare. More specifically, it is a branch of nation's armed offerings that is accountable for aerial fighting as distinct from an army, Navy or Marine corps. Typically, Air force are accountable for gaining manipulation of the air, carrying out strategic and tactical bombing missions, and proving aid to land and naval forces. Aircraft's are the most important section of aviation forces. The proposed counter measure dispenser gadget plays a critical section in securing the aircraft from overseas explosives or missiles.

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