

# 'Make-II' Procedure and details of Projects

# Navy Projects – 11 Nos.



# MAKE II PROJECTS - AIP ACCORDED

	<u>Name of Project</u>
1	Deep Sea Side Scan Sonar Towing Winch (DS4TW)
2	Upper Air Sounding System (UASS)
3	Expendable Underwater Target
4	Water Electrolysis Bi-Polar Hydrogen Generator
5	Digital Beamforming Based Satellite TV (DB2 ST)
6	Universal Proximity, Direct Action And Graze Fuses For Gun Ammunition Of 76 - 127mm



# 'MAKE II' PROJECTS - AIP ACCORDED

	<u>Project</u>
7	NVG Adaptation Filters & Image Intensifiers
8	Three Phase inverters
9	Detonator N5 MK2 for CDSC 0.5 Kg with VH2 Based Composition
10	Electronic Fuze for Anti-Submarine Rocket RGB-60
11	Detonator 7 Sec Delay for Hand Grenade 36

# DEEP SEA SIDE SCAN SONAR TOWING WINCH

- The Deep Sea Side Scan Sonar towing winch (DS4TW) in hydrographic surveying,
  - ✓ Towing of deep sea side scan sonar for deep sea bottom scanning
  - ✓ Delineation of underwater wreck
  - ✓ Self-contained, electro-hydraulic winch made of stainless steel connected with 1500 mtrs of double armoured coaxial tow cable of dia 10-12 mm in sea state 3-4 at ship speed upto 10 knots
- System must meet IMO and IEC standards for deck equipment (marine standard) or equivalent Indian standard
- Cost – 5.54 Cr (Qty-06 Nos)
- PFT - Capt Gurumani (26181834)  
Cdr AG Merwade

# UPPER AIR SOUNDING SYSTEM (UASS)

- UASS is an equipment for obtaining vertical profile of meteorological parameters
- The equipment consists of two parts:-
  - ✓ Ground Receiving Station , antennas and accessories
  - ✓ Consumable unit consisting:-
    - ❖ Met sensors & transmitter (Radiosonde)
    - ❖ Met balloons & Hydrogen
- The sensors with the attached transmitter are released into the atmosphere with the help Hydrogen filled meteorological balloons and the data received is processed by the ground station
- Cost – 40 Cr (60 systems and 12000 Radiosondes)  
PFT – Cmde Manoj Kumar Singh (23093274)  
Cdr A Vidyasagar (23010139)

# EXPENDABLE UNDERWATER TARGET (EUT)

➤ EUT is required to emulate the presence of a Submarine for Sonar operators to detect and track

## ➤ **Salient Features:-**

- ✓ Operate independently Underwater and Manoeuvre along a pre-determined path
- ✓ Imitate Acoustic Signature of Manoeuvring Submarine
- ✓ Capable of being launched from Ships or Helicopters
- ✓ Active Sonar repeater 3 – 35 Khz
- ✓ Broadband Noise 100 – 2000 Hz
- ✓ Operating at depth of 150 m
- ✓ Lightweight < 50 Kg
- ✓ Capable of 8 knots speed
- ✓ Min endurance of 4 hrs

PFT – Capt Ritchie Ranjan (23011680)  
Cdr V Moorjani (23010948)

# WATER ELECTROLYSIS BI-POLAR HYDROGEN GENERATOR

- Generate Hydrogen only from raw feed of water (no chemicals to be used and no chemical wastage to be generated)
  - Safety features during generation of Hydrogen, stowage in cylinders and while transferring of gas from cylinders to the balloon filling unit
    - ✓ Small size equipment (to fit in a room/ ship's compartment of minimum size 12 ft x 12 ft)
    - ✓ Environmental friendly and MARPOL compliant
    - ✓ Limited and low cost maintenance
    - ✓ Continuous availability of Hydrogen gas leading to optimal utilisation of UASS for building of reliable atmospheric database
  - Cost – One Cr/ System (Qty-10 Systems)
- PFT** – Cmde Manoj Kumar Singh (23093274)  
Cdr A Vidyasagar (23010139)



# Digital Beamforming Based Satellite TV DB2 ST

- Digital Beamforming Based Satellite TV System is used for uninterrupted reception in rough seas
- **Salient Features:-**
  - ✓ Small Form Factor – No Mechanical Part
  - ✓ **Uninterrupted Worldwide Reception**
- Cost – 1.4 Cr/ Set, to be ascertained during Industry Interaction/ Feasibility Studies (Qty-100 Nos.)

**PFT** – Capt Vivek Sharma (23011668)  
Cdr Akshay R Prabhu(23011101)

# NVG ADAPTATION FILTERS AND IMAGE INTENSIFIERS

- Indigenous development and supply of image intensifier tubes for night vision goggles
- Development of Gen 3 Night Vision Imaging System (NVIS) adapted for usage on board Multirole and Utility Helicopters
- **Salient Features:-**
  - ✓ Self-contained power source for primary and back up power for extended missions in harsh environmental and operating conditions
  - ✓ Capability of sustained usage in vibration environment
  - ✓ Long total service life in years (10 years / 10,000 operating hours at less than 10% SNR degradation)
  - ✓ Good performance in entire range of full moonlight to starlight conditions
- Qty – 504 nos.

**PFT** – Capt Brijesh Singhania (23010332)

Cdr Rishab Batra (23011247)

# THREE PHASE INVERTERS

## ➤ Salient Features:-

- ✓ End User – Dornier
- ✓ Main System – ELTA Maritime Patrol Radar E/L/M 2022A V(3)
- ✓ Sub System – Static Inverter
- ✓ Input – 28 V DC
- ✓ Output:-
  - ❖ 270 V DC for Tx Assembly
  - ❖ 115 V AC 3 phase, 400 Hz for RPA
- ✓ Power Output – 6 KVA approx.

## ➤ Cost – 30 Lakh/ Set (Qty – 25 nos.)

PFT – Capt Brijesh Singhania (23010332)  
Cdr Rishab Batra (23011247)

# DETONATOR N5 MK2 FOR CDSC 0.5 KG WITH VH2 BASED COMPOSITION

## ➤ Salient Features:-

- ✓ The detonator, when initiated by the 0.22 RF cap(with VH-2 composition), should ensure explosion of CDSC 0.5kg
- ✓ The detonator should ensure a specified delay life > 10 years

## ➤ Cost – 8.1 Cr (Qty – 180000 nos.)

PFT – Capt GR Wani (26194691)

Cdr S Dutt Roy (26194649)

# ELECTRONIC FUZE FOR ANTI-SUBMARINE ROCKET RGB 60

- To be designed to explode the anti-submarine rocket RGB - 60 at a preset depth or upon hitting the underwater target
- It should operate within the designated depth envelope:-
  - ✓ Length - 361mm
  - ✓ Dia. - 135mm
  - ✓ Weight - 6.5kg
  - ✓ Life > 10 years
- Cost – 1.3 Cr (Qty – 500/ Yr)

PFT – Capt GR Wani (26194691)  
Cdr S Dutt Roy (26194649)

# PROXIMITY, DA AND GRAZE FUZE FOR 76/62 SRGM WITH UNIVERSAL CAPABILITY FOR 76-127MM AMMUNITION

- It is proposed that the fuze for 76/62 SRGM be developed as an universal fuze with electronics that can be adapted for higher calibers
- *IN* uses guns of calibers in the range of 76mm to 100mm, and envisaged to use guns of higher caliber up to 127mm
- Salient features:-
  - ✓ Universal fuze should be adaptable to functioning in proximity(default) or DA mode
  - ✓ **Graze action backup**
  - ✓ Proximity mode should have Self Destruct option after a specified flight time as backup
- **Cost – 6000 per unit (Qty- 5000 fuzes @ 500/ Yr)**
  - **PFT – Capt GR Wani (26194691)**  
**Cdr S Dutt Roy (26194649)**

# DETONATOR 7 SEC DELAY FOR HAND GRENADE 36M

- The detonator, when initiated by the 0.22 RF cap(with VH-2 composition), should ensure explosion of CDSC 0.5kg
- The detonator should ensure a specified delay life > 10 years
- Cost – 800 per detonator (Qty- 5000)

PFT – Capt GR Wani (26194691)  
Cdr S Dutt Roy (26194649)

# Army Projects



# MAKE II PROJECTS - AIP ACCORDED

	<u>Project</u>
<b>1</b>	Upgraded Assault Trackway
<b>2</b>	MEAT (MANEUVERABLE EXPANDABLE AERIAL TARGET)
<b>3</b>	125 mm APFSDS for T-72 & T-90 Tanks
<b>4</b>	Light Weight Body Armour
<b>5</b>	Individual Protection System with inbuilt Sensors
<b>6</b>	Pre fragmented Programmable Proximity Fuse Ammunition

# UPGRADED ASSAULT TRACK WAY

<u>Sponsor Dte</u>	<u>Qty</u>	<u>Cost</u>	<u>AoN</u>	<u>Stg</u>	<u>Vendor Base</u> <u>/DAs</u>
DG CE	100	100 Cr	2017	IPMT	

## Brief of Case

- The equipment is held with Engineers for construction of operational tracks in under developed/desert terrain. The present ATW Class 12 has its limitations and a new track way is envisaged to support move of vehicles of weight upto 25,000kgs and will be lighter in weight with a reduced volume for faster employment
- This eqpt will replace the inservice ATW CI-12

## Milestones

- AoN accorded on 28 Jun 17
- EoI hosted on MoD website on 19 Mar 18

Proj Offr: Col Vikram Gulati

Dir CE -5(B), DG CE ,Kashmir House, Rajaji Marg , New Delhi - 110011

Tele : 23019604 ,Fax : 23019675 , E-mail : [ce5-einc-army@nic.in](mailto:ce5-einc-army@nic.in)

# MEAT (MANEOPERABLE EXPANDABLE AERIAL TARGET)

<u>Sponsor Dte</u>	<u>Qty</u>	<u>Cost</u>	<u>AoN</u>	<u>Stg</u>	<u>Vendor Base/ DAs</u>
DG AAD	50/Yr	79 Cr	-	AoN	

## Brief of Case

- MEAT is required to provide realistic live firing practice to crews of Air Defence weapons of Army, particularly the crews of long range missiles. The MEAT should be capable of a maximum speed of 400 Kmph or more and an altitude range of 20 m to 5000 m. It would be ground launched
- The case is at an advanced stage of accord of approval

## Milestones

- Eol uploaded on 13 Apr 18

# 125MM APFSDS AMMUNITION FOR T-72/T- 90

<u>Sponsor</u> <u>Dte</u>	<u>Qty</u>	<u>Cost</u>	<u>AoN</u>	<u>Stg</u>	<u>Vendor Base/</u> <u>DAs</u>
DG CE	1000	2500 Cr	-	AoN	

## Brief of Case

- 125mm APFSDS ammunition is primary tank ammunition utilised for destroying enemy tanks. There is a requirements to develop an indigenous APFSDS ammunition for T-72/T-90 tanks with a capability of achieving Depth of Penetration (DoP) of more than 600mm to enhance lethality within the existing safety and consistency parameters
- The case is at an advanced stage of accord of approval

## Milestones

- PSQR approved in GSEPC on 18 Jul 17
- Case to be fd in SCAP cycle in May 18

Proj Offr : Col Vishal Singh

Dir ISE (AC), DG MF , A Wing Sena Bhawan, Tele No 23335093

# LIGHT WEIGHT BODY ARMOUR

<u>Sponsor Dte</u>	<u>Qty</u>	<u>Cost</u>	<u>AoN</u>	<u>Stg</u>	<u>Vendor Base/ DAs</u>
DG Inf	1800000	930	-	Feasibility Study	

## Brief of Case

- The Bullet Proof Jackets presently do not provide adequate protection to all the vital organs of a soldier
- The weight is the biggest challenge in order to enable the soldier to operate in field with maximum efficiency
- The threat to the soldier is increased day by day from low to medium and to high velocity projectiles
- Therefore, there is a need to equip the soldier with light weight Body Armour, so as to have adequate protection against the varied threat levels

## Milestones

- Inadequate vendor response at Feasibility Study stg. Time extn for Feasibility Study reqd

Proj Offr : Col H Kataria, SM

Dir Inf - 3, Room No 415, D Wing Sena Bhawan

Tele No- 011-23333819

# INDL PROTECTION SYS WITH INBUILT SENSORS

<u>Sponsor Dte</u>	<u>Qty</u>	<u>Cost</u>	<u>AoN</u>	<u>Stg</u>	<u>Vendor Base/ DAs</u>
DG RR	59825	-	-	Feasibility Study	

## Brief of Case

- For CI/CT Ops
- A vital part of this adoption will constitute individual protection gear of the soldiers.
- In addition to monitor pers medical parameters to incl BP, Pulse and other vitals for speedy and realistic cas evac during ops.

## Milestones

- At Feasibility Study stg

Proj Offr : Col Aditya Mishra

Dir RR-2, DG RR

Delhi Cantt

Tele No 011-25692895

# PRE FRAGMENTED PROGRAMMABLE PROXIMITY FUZED AMMUNITION

<u>Sponsor Dte</u>	<u>Qty</u>	<u>Cost</u>	<u>AoN</u>	<u>Stg</u>	<u>Vendor Base/ DAs</u>
DG AAD	9 Lac	-	-	Feasibility Study	

## Brief of Case

- With the increase in air threat envelope and multiplicity of air threat platforms, there is a requirement to enhance the lethality and accuracy of the present air defence ammunition of L70 gun system.
- The ammunition should have multi target handling capability along with capabilities of air burst, proximity, point detonation and variable and programmable provisions.

## Milestones

- At Feasibility Study stg

Proj Offr: Col Rajesh Tanwar

Dir (Planning), Army Air Def Directorate, Room No – 606 D-1 Wing

Tele/ Fax :23339001/23333632

# Air Force Projects



# MAKE II PROJECTS - AIP ACCORDED

	<u>Project</u>
1	Chaffs & Flares
2	Long Range Dual Band Infrared Search and Track system (IRST)
3	Advanced Self Protection Jammer (ASPJ) Pods and Radar Warning Receiver
4	Aerial Fuses for Bomb
5	125 kg bomb (akin to MK-81 bomb)
6	Air to Ground Rockets
7	Foldable Fiberglass Mat (FFM) for Rapid Runway Repair
8	7.62mm Ammunition for Galil sniper rifle (NATO), 5.56mm Ammunition for Negev LMG (NATO belted) 5.56mm Ammunition for TAVOR Assault Rifle (NATO)

# CHAFFS AND FLARES



# CHAFFS AND FLARES

## ➤ Brief :

- Chaffs and Flares are countermeasure devices used by aircraft against enemy radar, radar guided missiles and heat seeking missiles
- These are fired in order to mislead the IR seekers and sensors
- Requirement is large and recurring
- Quantity: Chaffs-10 lakh (for five years)  
Flares-1.5 lakh (for five years)
- Approx. Cost: Rs 142.62 Crore

# LONG RANGE DUAL BAND INFRARED IMAGING SEARCH AND TRACK SYSTEM (IRST)

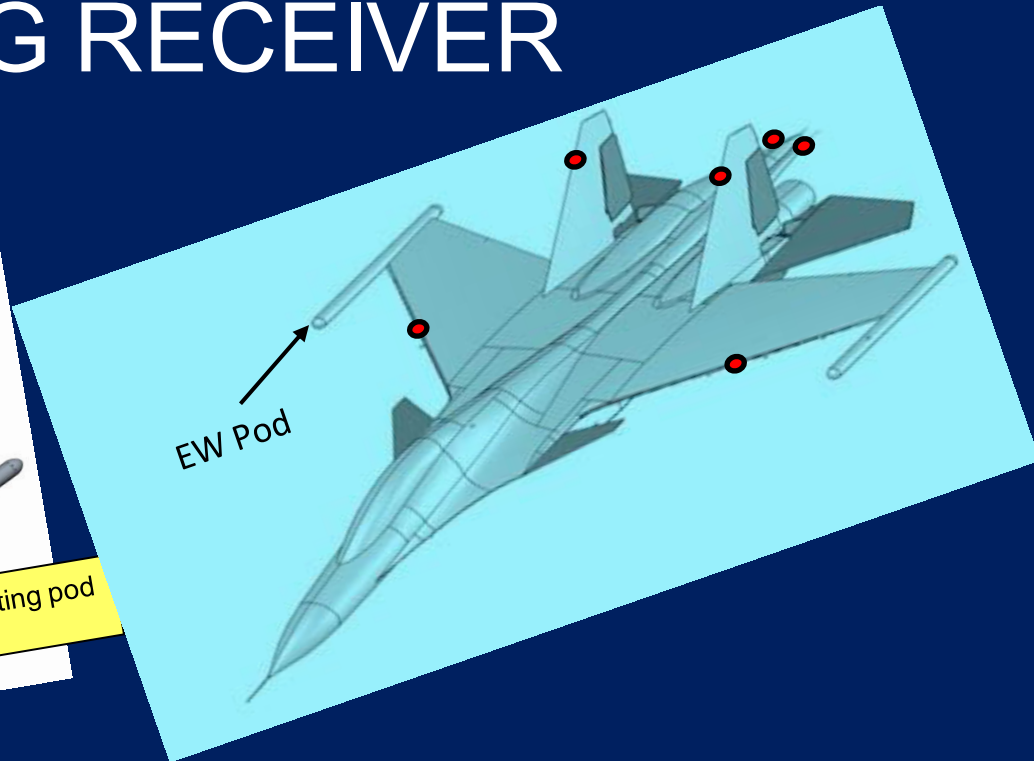
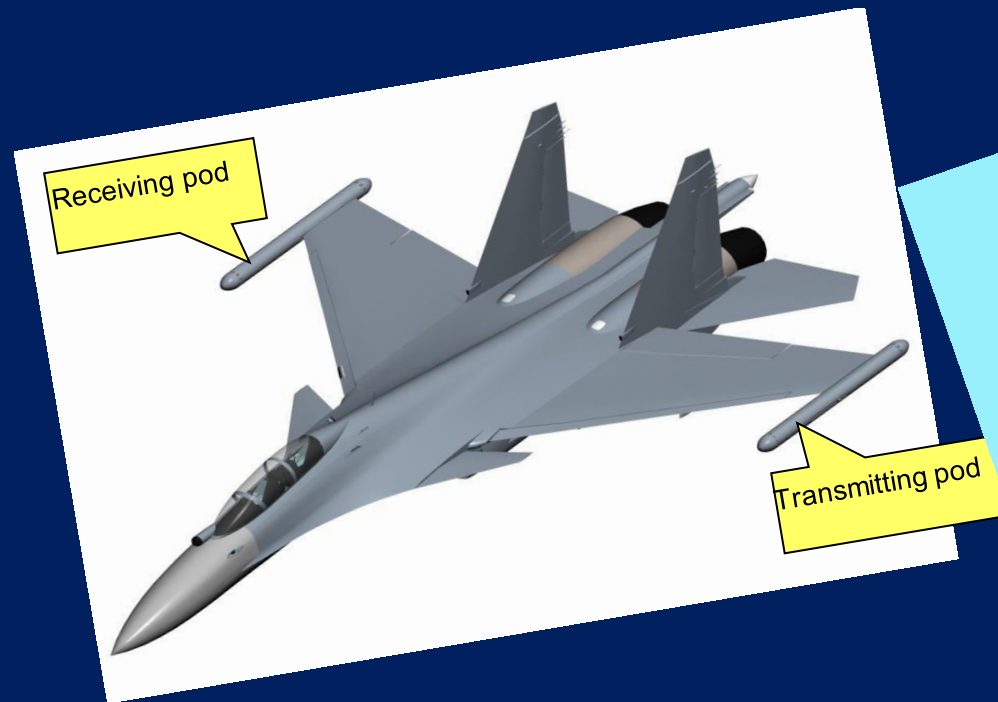


# LONG RANGE DUAL BAND INFRARED IMAGING SEARCH AND TRACK SYSTEM (IRST)

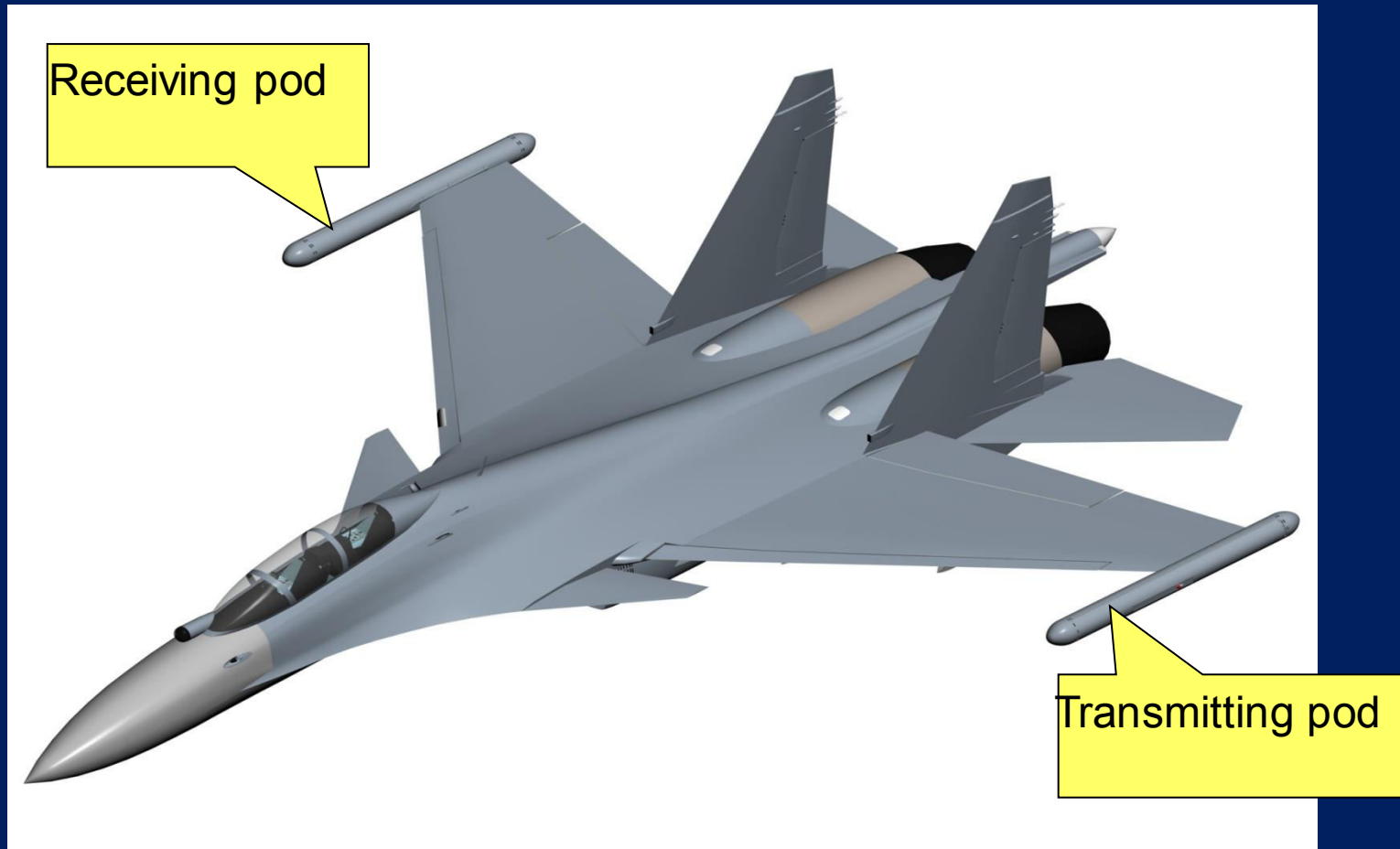
## Brief

- System should be form fit compatible with existing system on fighter aircraft
- Mechanical & electrical requirements of the system should be same as that of the existing system on aircraft (OLS)
- New system should interface with the aircraft mission computer and exchange necessary target information
- Quantity: 100
- Approx. Cost : 2000 Cr

# ADVANCED SELF PROTECTION JAMMING(ASPJ) AND RADAR WARNING RECEIVER



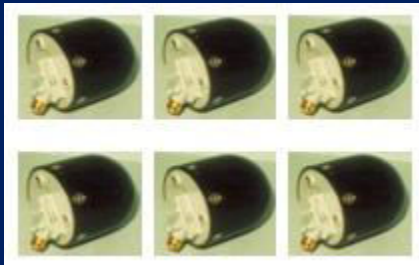
# ADVANCED SELF PROTECTION JAMMING(ASPJ) PODS



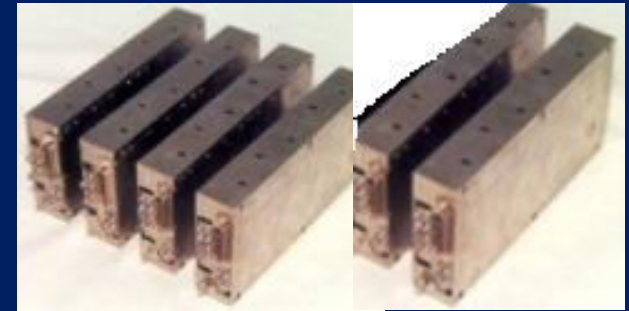
# RADAR WARNING RECEIVER



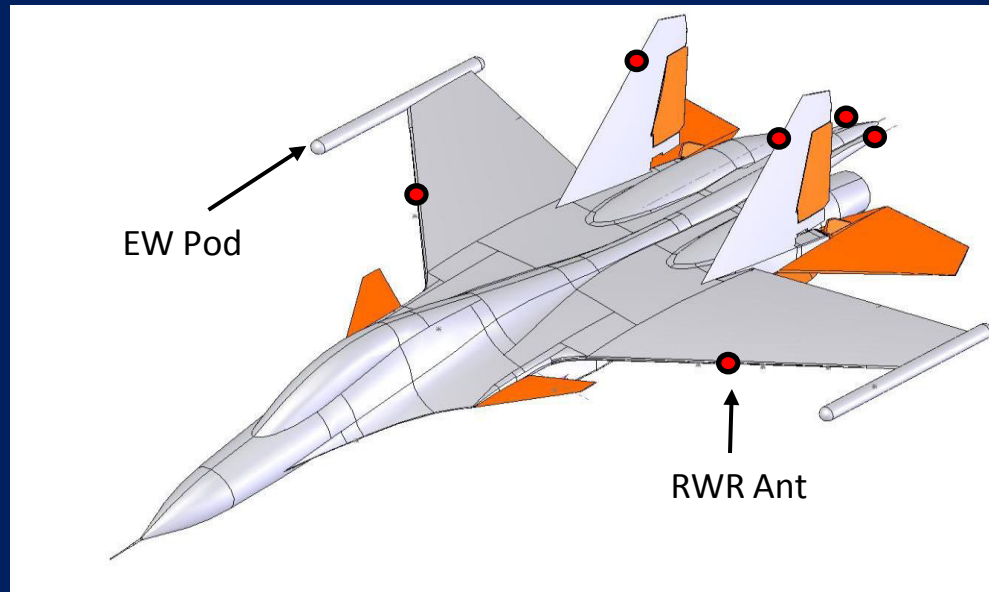
Processing Unit



1-18 GHz Spiral Antennas



RF Units (RFU)





# RWR AND ASPJ PODS

## ASPJ

- Fully automatic, capable of intercepting, analyzing, categorizing, prioritizing and initiating optimum counter offensive using active jamming techniques against multiple threats in a dense EW environment

## RWR

- Radar Warning Receiver detects and identifies various radar emitters (ground based & airborne), provides direction and approximate range of emitter
- System is used to improve situational awareness
- System is used for queuing the CMDS for self protection

Quantity: 100

# AERIAL FUSE FOR BOMB

## ➤ Aerial fuse for Bomb

➤ Should be capable to withstand high speed and 'g' forces during carriage and should be activated only when desired 'g' forces are attained.

➤ Quantity: 3000 (per year)

# 125 KG BOMB

## ➤ Brief :

➤ Design & development of 125 Kg Bomb (akin to MK-81 Bomb)

➤ The bomb should have facility for nose fusing as well as tail fusing of the store with fuse AVU-ETM/ETMA and any futuristic fuse

➤ Quantity:      500

# 70 mm AIR TO GROUND ROCKETS



# 70 mm AIR TO GROUND ROCKETS

- Brief :
  - Development of 70 mm air to ground rockets for various platforms of IAF
  - Requirement large and recurring
- Quantity: 80,000 (total) (over 3-5 years).
- Approx. Cost : Feasibility study in progress



# FOLDABLE FIBREGLASS MAT (FFM)

## Brief

- Rigid, light weight composite material reinforced with specially developed fibre glass polyester resin weaved and cut to shape to provide the mat. New technique to repair large size crater.
- Qty to be procured – Approx. 122 sets per year
- Cost - Rs 192 crores approx ( to be ascertained during industry interaction/feasibility study)
- Timeline – 2 yrs

Thank you