Effective Countermeasures Against MANPADS

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Table of Contents

I. Overview
II. Types
III. Countermeasures
IV. Conclusion
I. OVERVIEW

What is MANPADS?
- Man Portable Air Defense System

Other names
- Shoulder Launched Air Missile
- SAM(Surface to Air Missile)

Feature
- Protect ground troops from helicopters or air attacks
- Heat-seeking missile
MANPADS Threats

- Threat increased after 9·11 incident
- Threat emerged after TWA Crashed in 1996
- Recent high threats after the Mombasa Incident (2002) and the DHL Incident (2003)
- Newly emerging threat exceeds Aircraft Hijackings

History and Current Status

- First developed in the late 1950s (Redeye)
- Lots of MANPADS produced since 1970s
- Distributed to the Mujahedin in 1980
- More than 100,000 MANPADS dispersed World Wide as of 2004

27 Terrorist Groups own MANPADS
※ Mainly Al-Qaeda affiliated groups
## Main Specification

<table>
<thead>
<tr>
<th>Class</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>1.5 m ~ 1.9 m</td>
</tr>
<tr>
<td>Weight</td>
<td>15 kg ~ 18 kg</td>
</tr>
<tr>
<td>Maximum Altitude</td>
<td>4 km (13,000 feet ~ 15,000 feet)</td>
</tr>
<tr>
<td>Speed</td>
<td>2,400 km / hour</td>
</tr>
<tr>
<td>Price</td>
<td>US$ 25,000 ~ US$ 250,000</td>
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## Attack Points & Threat Area

**Attack Points:** Take-off / Landing

※ Especially Take-off because the aircraft is full of fuel. This causes severe damage to surrounding populated area.

**Threat Distance:** Total of 80 km
- Take-off: 32 km
- Landing: 48 km

**Threat Width:** 9.6 km

**Threat Height:** 3 km ~ 4.5 km
Threat Area

Landing

Take-off

80 km
(Landing : 48 km, Take off : 32 km)

9.6 km
3 km ~ 4.5 km

MANPADS - Advantage

Maximizing result
(No single proper countermeasures so far)
Easy to Carry and Conceal
Easy to Aim and Fire
Free Firing Position
(launched from vehicles, boats, or populated areas.)
Easy to Store and Maintain
Inexpensive
MANPADS - Disadvantage

Difficult to Operate
ex) Mombasa incident

Unreliable Qualities

Cannot Incur Fatal Damage
(Aircrafts can operate with only one engine)

Target only Engine-heating aircraft

Only be launched from behind the aircraft

II. TYPES
Types of Manpads

1st Generation (Primitive Heat Seeker)
- RED EYE (Produced in 1950)

2nd Generation (Old Heat Seeker)
- SA-7, SA-14, Blow pipe, Stinger

3rd Generation (Advanced MAMPADS)
- SA-16, SA-18, Mistral, FIM-92, Stinger FIM-92, Javelin

1st Generation

RED EYE (U.S 1950~1967)

- First MANPADS Model
- Details
  - Primitive Heat-Seeking
  - Max Altitude range: 2.7km (8,900 ft)
- Quality not much reliable
2\textsuperscript{nd} Generation

SA-7b (Strela2, Russia, 1972)

- Deployed since 1970’s, 1980 widely

- Details:
  - Old Infrared Seeker
  - Max Altitude Range: 4.2km (14,000 ft)

- MANPADS most commonly used by Terrorist groups
  ※ Al Qaeda, Hezbollah, etc. (Total of 9 Groups)

- Not correctly hit the target when Countermeasures applied

3\textsuperscript{rd} Generation

Stinger FIM-92 (U.S. 1990)

- Most advanced and accurate MANPADS

- Details
  - Max. Altitude Range: 4.7km (15,400ft)

- Not widely dispersed to Terrorist

- Need some training to operate
III. COUNTERMEASURES

Countermeasure

Aircraft Measures – System Installing
- IRCM
- Flare

Ground Measures

Air Measures

Cooperation
Aircraft Measure – IRCM

IRCM (Infrared Countermeasure)

- Military Jets Applied
- Principle: change the missile’s direction by giving off IR
- Application: US & other country under development
- Estimated Cost: $US 1 ~ 3 million

How it Works

Stage 1: Launch a missile.
Stage 2: Sensors detect a missile launch.
Stage 3: The system fires an infrared beam at the missile, blinding its heat-seeking sensor.
Stage 4: The missile is unable to track the plane, the rocket is diverted away from its target.
**Aircraft Measure – Flare**

**Decoy Flares**
- Military Jet Applied
- Principle:
  - Ejecting flares when missile is approaching
- Application:
  - Israeli Commercial Aircrafts

**How it Works**
- Detects the Launched Missile
- Projects Flare around Aircraft
- Missile is misdirected
Air Countermeasures

- Aircrafts Escort by Military Fighters
- Aircraft Frame Hardened
- Special Paints on Aircrafts
- Pilot Training
- Aircraft Power Minimized
- Flight Procedures Changed

Ground Countermeasures

- Heighten Airport Perimeter Patrol
  (Airport Authority Portion)
- Anti Missile System Positioned
- Military Helicopter Patrol
- Flare Dispensing around Airport
Countermeasure-Cooperation

Intelligence Gathering System among countries.
MANPADS Counter Proliferation among countries.

No single solution is available.
International Standards should be established.
Responsibilities among Organizations must be defined especially in Ground Countermeasures.
More thorough Discussion needed to prevent MANPADS attacks.
Conclusion

Cooperation between states
Urgently needed.

Exchange the Threat Information.

Share the Technology and Tactics.

Develop World Wide Standards against MANPADS.
THANK YOU FOR YOUR ATTENTION!!