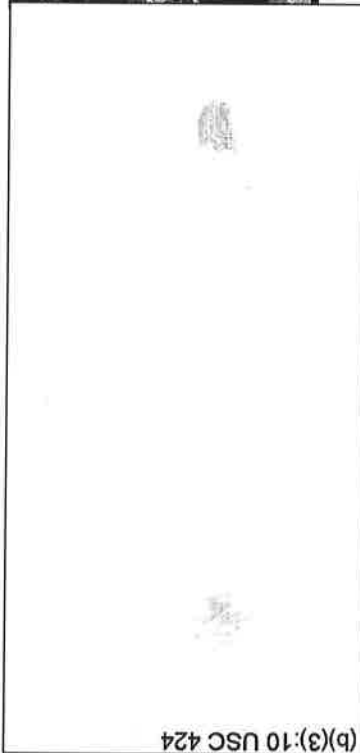


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MANPADS Generations I & II



(b)(3):10 USC 424



Defense Intelligence Agency

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Outline (U)

- **Generation I Systems (SA-7 type)**
 - **Proliferation**
 - **Characteristics/Capabilities**
 - **Upgrades**
- **Generation II Systems (SA-14 & SA-16)**
 - **Proliferation**
 - **Characteristics/Capabilities**
- **Shelf Life**

GENERATION I (U)

(b)(3):50 USC 3024(i)

- Hot Metal Trackers
- No Countermeasure Resistance
- Systems
 - SA-7
 - Copies of SA-7
 - Redeye

SA-7a vs. SA-7b (U)



SA-7a - 1967

(b)(1);Sec. 1.4(c)

(b)(1);Sec. 1.4(c)

- Max Range
- Max Altitude
- Maneuverability
- Max Velocity
- Max Flight Time

(b)(1);Sec. 1.4(c)



SA-7b - 1972

Modifications:

- Hot Metal Tracker

• Beam/Rear Aspect

• Shortcomings

- Low altitude
- IR jammers very effective
- IR suppression
- Flares

(b)(1);Sec. 1.4(c)

HN-5/5A/5B (U)



- HN-5 is a copy of the Russian SA-7b

• HN-5A

• HN-5B

(b)(1);Sec. 1.4(c)

(b)(1);Sec. 1.4(c)

HN-5

DEPLOYMENT

HN-5

countries

HN-5A

countries

HN-5B

countries

(b)(1);Sec. 1.4(c)

(b)(1);Sec. 1.4(c)

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STRELA 2M/A (U)

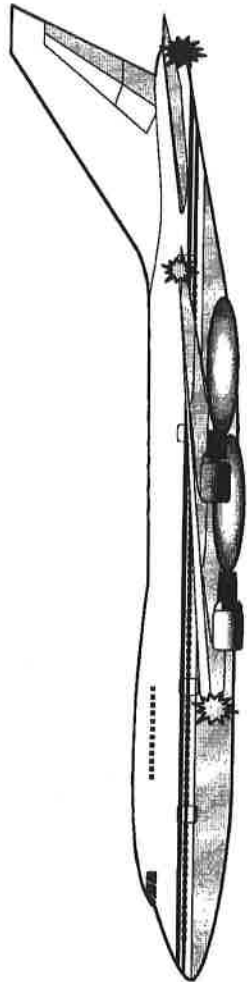
- Produced by Federal Republic of Yugoslavia (FRY) – late 1980s
- Reduced Electronics
- Larger Warhead
-

(b)(1);Sec. 1.4(c)

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Missile Track Points (U)



- SA-7 Type

- Hot Metal

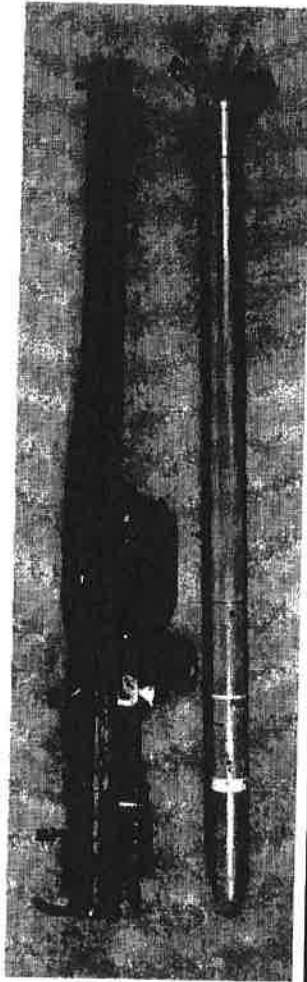
(b)(1); Sec. 1.4(c)

- Newer MANPADS

- Exhaust Gases

- Hot Metal

SA-7b Upgrade Programs (U)



Upgrade Program #1

Upgrade Program #2

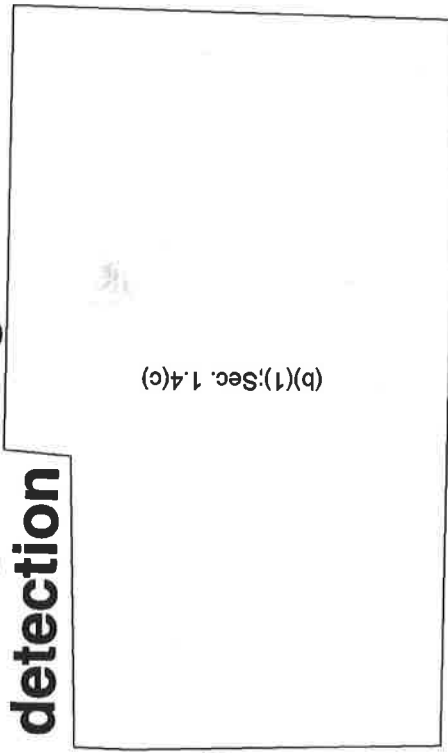
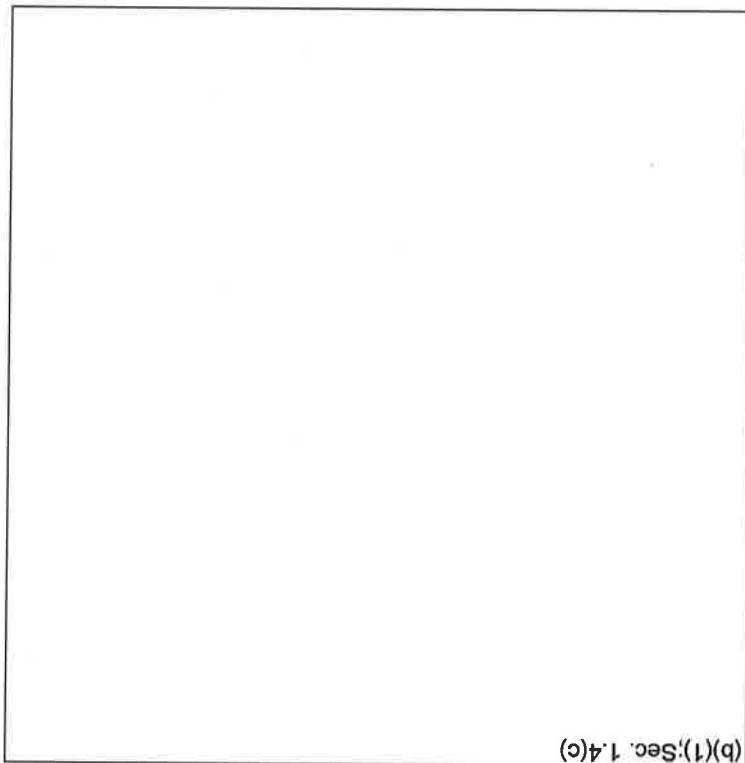
- Designer: LOMO KBM, RUS
- Designator: Strela-2M2/9E46M
-

(b)(1);Sec. 1.4(c)

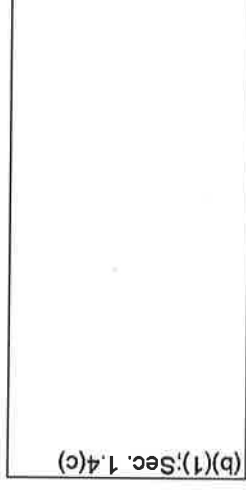
SA-7b Upgrade Program #1

(Geofizika Design)(U)

- Replaces the standard seeker head
- All aspect target detection



GENERATION II (U)



- **Plume Trackers**
- **Limited Countermeasure Resistance**
- **Systems**
 - **SA-14**
 - **SA-16**
 - **Saddam's Arrow**

SA-7b vs. SA-14 (U)



SA-7b - 1972

(b)(1);Sec. 1.4(c)

-  - Beam/Rear Aspect
- Shortcomings
 - Low altitude
 - IR jammers very effective
 - IR suppression
 - Flares

- Hot Metal Tracker



SA-14 - 1977

(b)(1);Sec. 1.4(c)

-  - Engine exhaust plume
- Good all aspect/low altitude
- Shortcomings
 - IR jammers
 - IR suppression
 - Flares

SA-14 vs. SA-16 (U)



SA-14 - 1977

(b)(1);Sec. 1.4(c)

- Engine exhaust

plume

- Good all aspect/low altitude
- Shortcomings
 - IR jammers
 - IR suppression
 - Flares



SA-16 - 1981

(b)(1);Sec. 1.4(c)

- Engine exhaust

plume

- Good all aspect/low altitude
- Shortcomings
 - IR jammers
 - IR suppression
 - Flares

Max Range

Max Altitude

Maneuverability

Max Velocity

Max Flight Time



(b)(1);Sec. 1.4(c)

Iraq: Saddam's Arrow (U)

- Began reverse engineering of SA-16
- Never beyond developmental stage
-

(b)(1);Sec. 1.4(c)

Optical Assembly Determined

(b)(1);Sec. 1.4(c)

(b)(1);Sec. 1.4(c)

Shelf Life Tests (U)

The systems with the worst appearance were tested (broken sights, rotten & moldy shoulder straps, missing gripstock caps, dirty)

(b)(1);Sec. 1.4(c)

(b)(1);Sec. 1.4(c)

MANPADS in Cambodia (U)

-
- **20+ Years Old**
- **High Humidity Environment**
- **Marginal Storage Conditions**

(b)(1);Sec. 1.4(c)

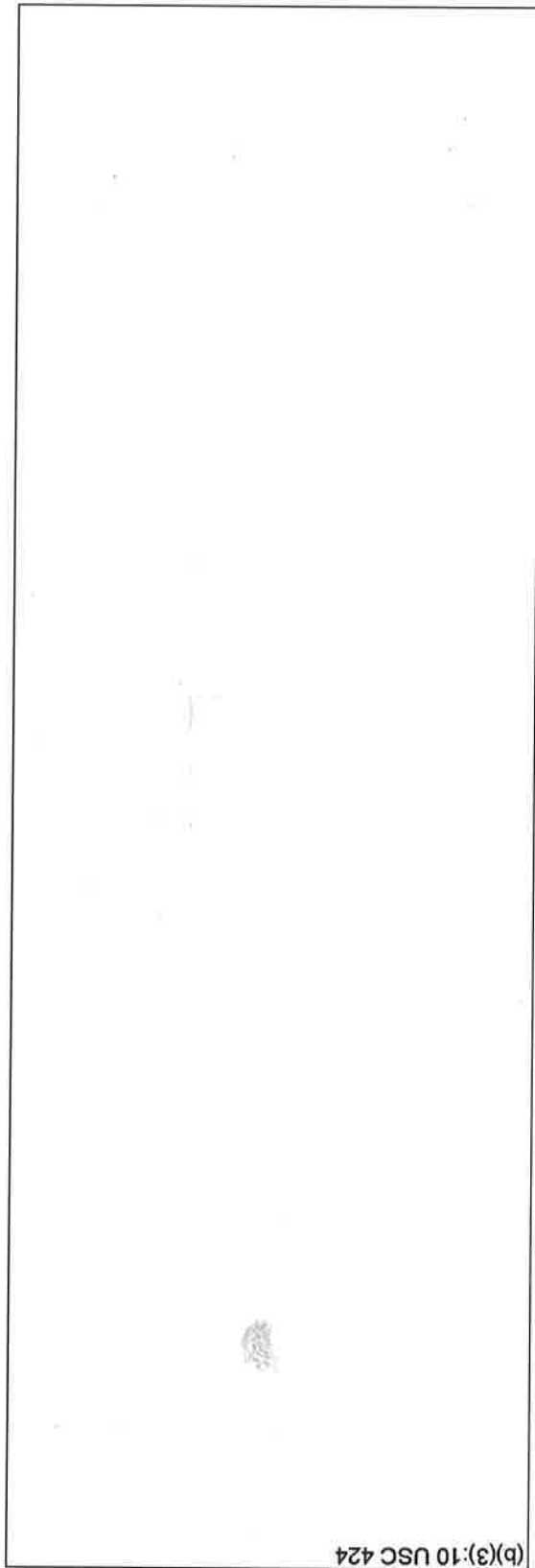
Summary (U)

- **Gen I & II Systems highly proliferated**
 - Deployed in more than 100 countries
 - Held by more than 40 Non-State Groups
- **Upgrades Packages Available**
 - Improved IRCCM
 - Greater Detection Range
 - Greater Lethality
- **Long Shelf Life – 25+ years**

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MANPADS

Generations I & II



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