

MATADOR™ Infrared Countermeasure System for Business Jet Aircraft



Photography courtesy of Gulfstream Aerospace



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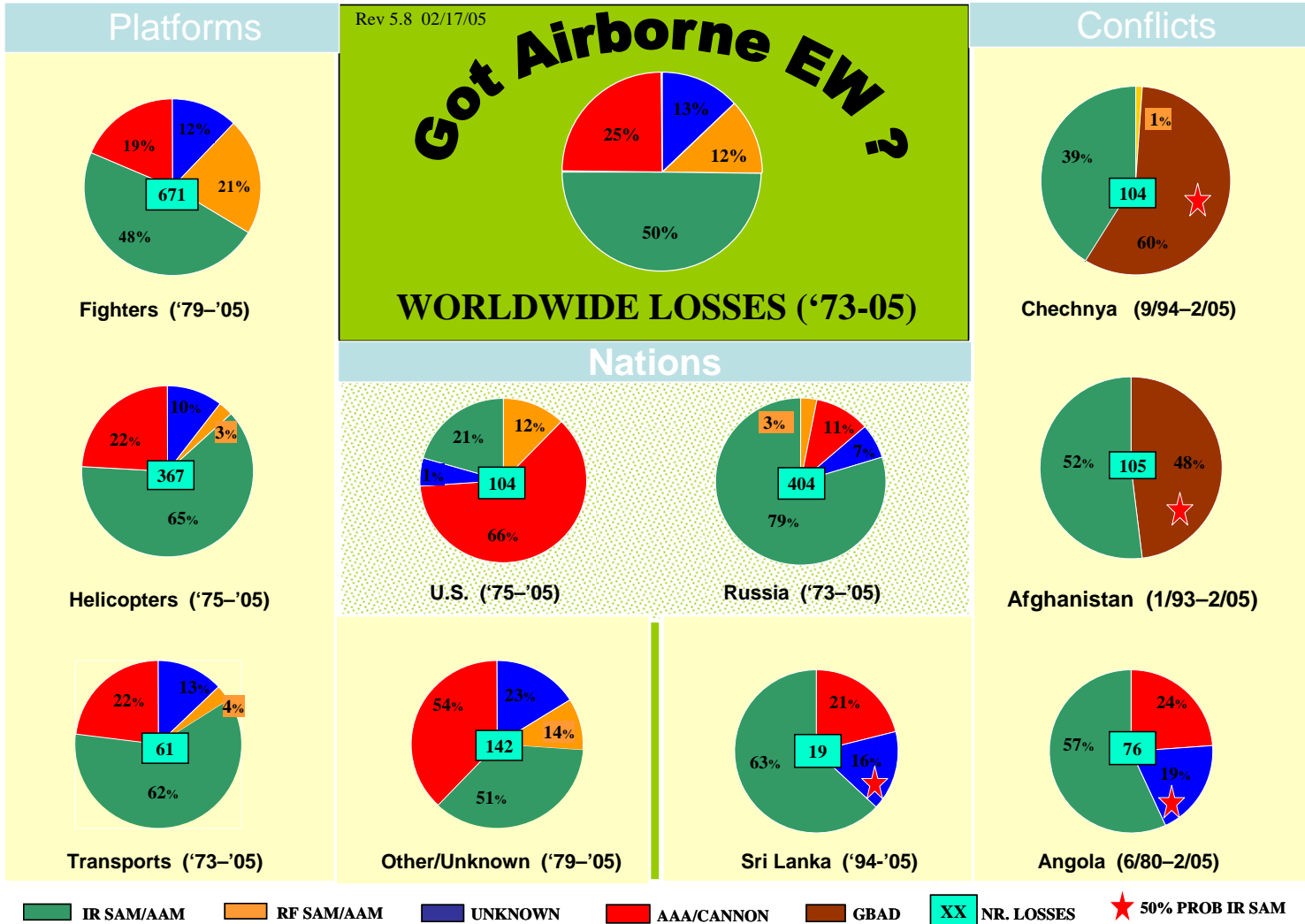
THE IR THREAT

Shoulder Launched Missile

- Light Weight & Mobile
- Requires Little Training
- Available Worldwide
- Effective

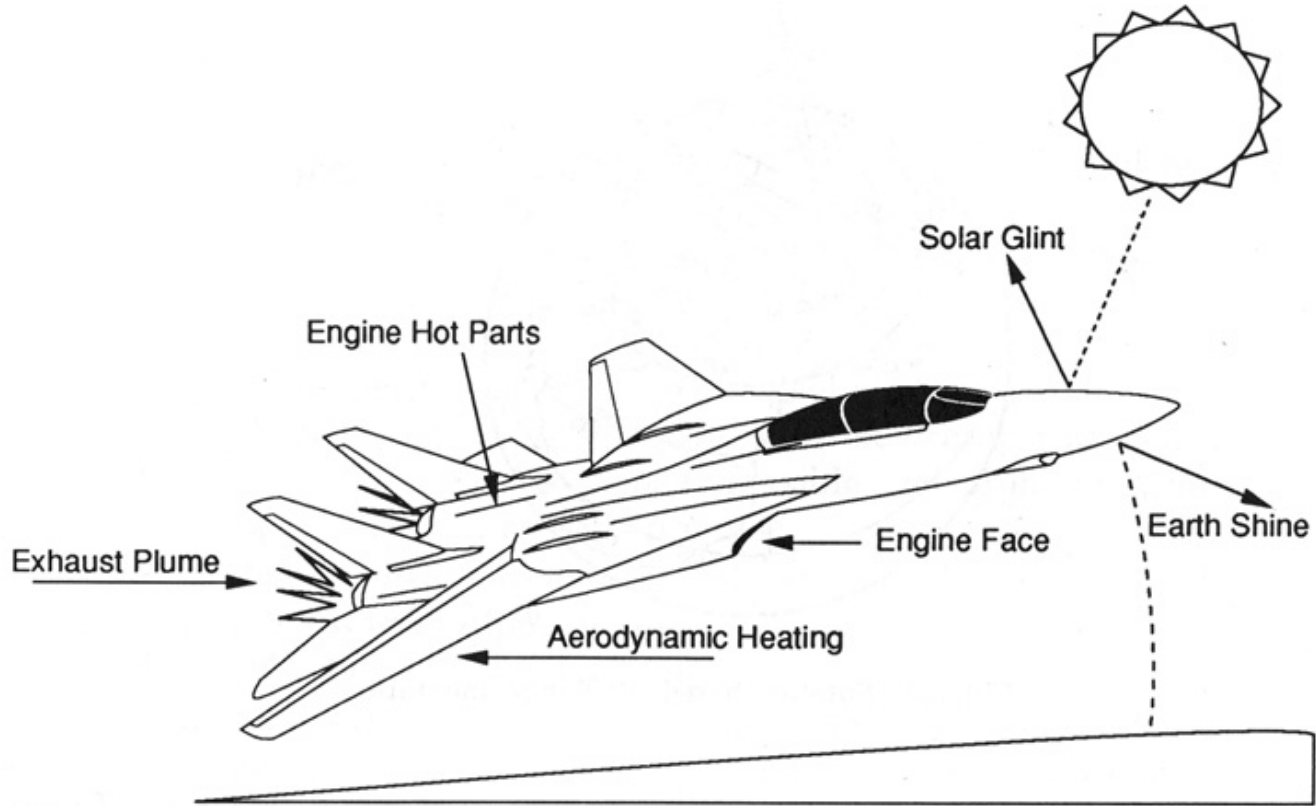


Worldwide Losses



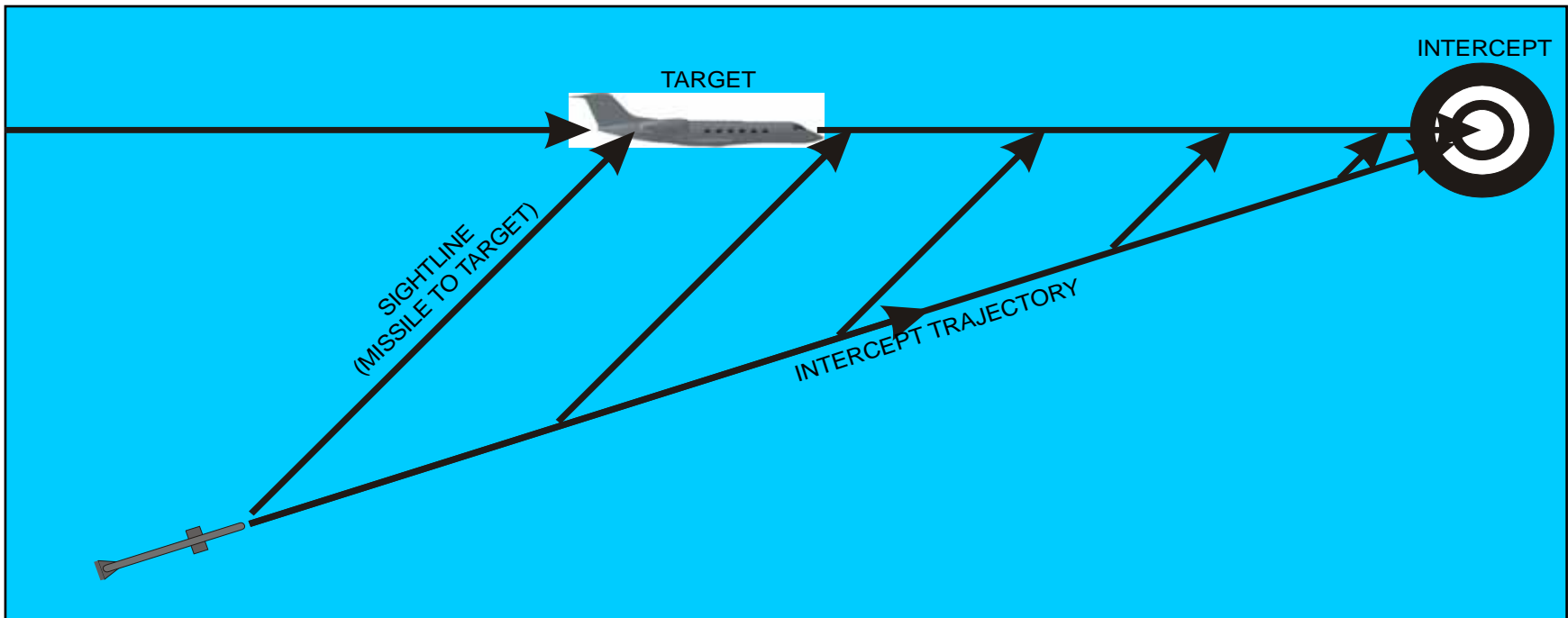
HOW MISSILES WORK

Sources of Tracking Energy



Missile Guidance

- Proportional Navigation
 - If missile is on intercept trajectory then the sightline rate to the target remains constant



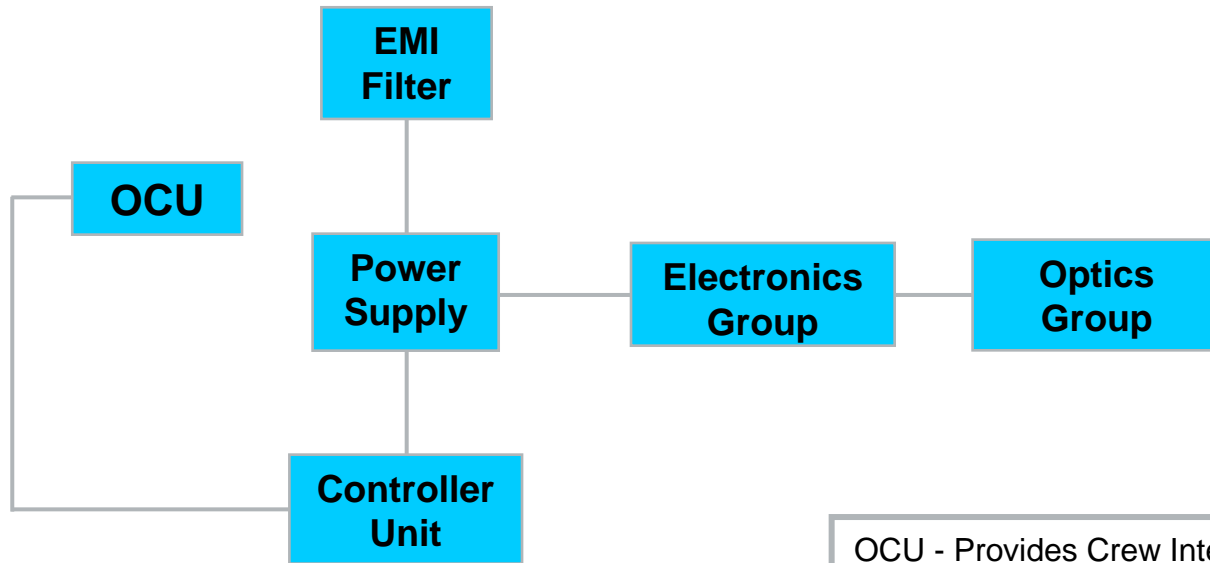
HOW MISSILES ARE DEFEATED

How IR Countermeasures Work

- Infrared Countermeasures (IRCM)
 - Defeats infrared missiles
 - Provides false information to missile
 - Electronically pulses a light source
 - Flares
 - Lamps
 - Operates throughout aircraft mission
 - Transmitted energy greater than aircraft
 - Ratio jammer/aircraft signature varies with missile type or family
 - Designed to fit a specific aircraft
 - Designed to fit specific threats

MATADOR OVERVIEW

MATADOR Single Transmitter Block Diagram



System Weight: <200 lb. (less Cables)

System Power: 7.5 KVA

Interface Hardware Weight: ~200 lb.

- OCU - Provides Crew Interface with System
- Controller Unit - Controls System Operation
- EMI Filter - Isolates System from Aircraft
- Power Supply - Converts AC to DC
- Electronics Group - Shapes Power
- Optics Group - Radiates Optical Energy

Typical MATADOR Installation



Photography courtesy of Gulfstream Aerospace

Operator Control Unit

- Located in Crew Station
- Controls
 - System Power Activation
 - Modes of Operation
 - Transmitter
- Provides
 - System Status
- Lighting
 - Indicator Bulbs
 - Edge-Lit Panel



Length: 6.0 in
Width: 6.0 in
Height: 3.0 in
Weight: 2.3 lb

Controller Unit

- Located in Equipment Rack
- Operates System
 - Two Microprocessors
 - Housekeeper & Jammer
 - Controls Lamp, Power Supply Unit, Modulator & Capacitor Plate Assemblies
- Provides BIT Status
 - Transmitter
 - Self
 - Monitors Lamp, Power Supply Unit & Modulator
- Has Cooling Fan



Length: 17.0 in
Width: 5.0 in
Height: 8.0 in
Weight: 11.53 lb

Power Supply Unit

- Located in Equipment Rack
- Converts AC Power to DC
- Provides Power for System
 - Transmitter
 - -830 Vdc to Modulators & Capacitor Plate
 - 3-Phase Power to Fans
 - 26 Vdc for Modulator & Cap Plate
 - Controller Unit
 - ± 26 Vdc (± 12 Vdc)
 - 22 Vdc (+5 Vdc)
 - Fan Power
- Protected With Own Circuit Breakers
 - Main Breaker Magnetic Type



Length: 25.0 in
 Width: 5.0 in
 Height: 10.0 in
 Weight: 65 lb

EMI Filter

- Located in Equipment Rack
- Function
 - Corrects for Power Factor
 - Harmonic Isolation of System
- Reduces Harmonic Feedback
- Input/Output Connectors
 - 3-Phase Power from Aircraft
 - 3-Phase Power to System



Length: 16.0 in
Width: 5.0 in
Height: 7.0 in
Weight: 30 lb

Aft Transmitter Group

- Configurable Line Replaceable Units
- Located in Tail Cone (varies with application)
- Consists of:
 - XMTR Electronics Group
 - Housing
 - EMI Shield
 - Modulator
 - Cap Plate
 - Harness
 - XMTR Optics Group
 - Ring Assembly
 - Reflector Assembly
 - IR Source
 - Fairing Assembly

Housing Assembly with EMI Shield

- Located <10 ft from Reflector (Optics Group)
- Hard Mounted to Fuselage
- Rail Mountings
 - Modulator
 - Capacitor Plate
 - Uses Quick Disconnects
- Front EMI Shield
 - Uses Captive Fasteners
- Input Connector from PSU Cable
- Harness Connects
 - Modulator & Cap Plate
 - Reflector Assembly

Ring Assembly

- Varies with Application
- Hard Mounted to Fuselage
- Mounting Surface for:
 - Reflector Assembly
 - Fairing Assembly
- Quick Disconnect Latches
- Interface for Cooling
 - Duct Flange
- Cable Feed-through Holes



Aft Reflector Assembly

- Varies with Application
- Mounted to Ring Assembly
- Contains:
 - IR Source
 - Optics
- Input Connector:
 - Electronic Housing
- Optics:
 - Shaped for Location
 - Removable

Fairing Assembly

- Mounts to Ring Assembly
 - Varies with Application
 - Fits Over Reflector
 - Environmentally Protects Reflector
 - Aerodynamically Designed
 - Has Covert Filters
 - Coating for Emissivity
 - Cuts White Light
 - Color of Aircraft By Modifier



BAE SYSTEMS SUPPORT

FAA Credentials

- Facility inspection system in place
 - Established in 1992
 - Under 4-yr audit cycle
- Part manufacturing approval
 - All STC'd aircraft included
 - Amend with each STC
 - Long Beach MIDO oversight
- FAA Certified Repair Station
 - FAA Licensed Repair Technicians
 - DER/DMIR Support as Required

Manuals

- BAE Systems provides:
 - Source data for aircraft modifier
 - “O” Level Maintenance Manual
- Manual Format
 - English language
 - Company format

Crew Training

- One day course
- Course conducted in English
- Content includes:
 - IR Theory
 - Missile Theory
 - System Theory
 - System Operations
 - Conducted on aircraft as required

Maintenance Training

- Up to 40-hour Course at BAE Systems
 - Tailored to support user's Maintenance Concept
- Course conducted in English
- Content includes:
 - IR Theory
 - Missile Theory
 - System Theory
 - System Operations
 - Conducted on System Test Station
 - Lab Troubleshooting & Test Equipment Use

Field Service Support

- Tailored to support user
 - Available for life of system
 - On-site assistance provided “as required”
- Teams consisting of:
 - Engineers & technicians
 - Specialist “as required”
- Teams will deploy worldwide

Repair Support

- Repair services available for life of system
 - Extended warranty
 - As required (piece part specific)
- Repair services conducted at Ontario, CA.
 - Within FAA certified facility
 - Under Depot control process

Maintenance Equipment

- Repair equipment available
 - On-aircraft Test Set
 - Used for troubleshooting
 - Flies with aircraft
 - Tools required
 - Standard hand tools

Summary

- MATADOR:
 - Approximately 30 installations in 9 different countries on 9 different platform types
 - FAA pedigree - seven Supplemental Type Certificates and two European equivalents
 - Supported by FAA Certified Repair Station
 - Provides coverage against the most widely proliferated surface-to-air missile threats

“Now” Solution - Affordable & Off-the-Shelf

BAE SYSTEMS