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**Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604287F / <i>Physical Security Equipment</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	5.973	35.458	19.739	0.000	19.739	9.492	9.773	10.142	10.350	Continuing	Continuing
655120: <i>Physical Security Equipment - SD ED</i>	-	5.973	35.458	19.739	0.000	19.739	9.492	9.773	10.142	10.350	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Integrated Base Defense Security Systems (IBDSS) provides improvements and enhancements, demonstrates, and tests Physical Security Equipment (PSE) systems to include Force Protection. This program supports the protection of tactical, fixed, and nuclear weapons systems, AF personnel and AF facilities. The PSE program is organized to provide PSE RDT&E for Air Force specific needs but as a complement to, and in conjunction with, the PSE RDT&E programs funded by the DOD Physical Security Enterprise and Analysis Group (PSEAG). As such this program will obtain, demonstrate, and test PSE in the same manner and to the same standards and architecture as PSEAG-funded projects to ensure interoperability with PSEAG-developed PSE. In support of PSE, this RDT&E program includes spectrum planning for radio frequency (RF), communication security (cyber), and information assurance requirements. This Program Element also includes funding for Force Protection Commercial Off The Shelf (FP COTS) market research, evaluation and testing. The FP COTS testing applies to all available technologies (delay, denial, detection, assessment, communication display, access control, power, mobility, and defeat effects) which are considered effective for AF physical security use. This program supports the maintenance and test support at Site C 3 and the Cold Weather Test Site (CWTS), as annotated in DoD Directive 3200.11, listing the 46th Test Wing (TW) as a Major Range and Test facility, conducting developmental and operational testing as the primary mission. Force Protection programs are inherently subject to rapid changes in the operational environment and will retain sufficient Program flexibility to meet changes in location, scope and capability in order to protect Air Force people, facilities and warfighting assets.

Counter Small Unmanned Aerial Systems (Cs-UAS) Joint Emergent Operational Need (JEON) is a rapid acquisition and deployment capability existing of full kill (detect, track, assess and defeat with various capabilities (fixed, mobile, portable and hand-held.) It is a layered system-of-systems using COTS technologies, integrated via GOTS C2 system.

Counter Small Unmanned Aerial Systems (Cs-UAS) Joint Urgent Operational Need (JUON) supports EUCOM JUON to protect specific strategic assets in overseas theaters of operation from the evolution of small unmanned aerial systems based on low cost, extensive proliferation, and availability in the commercial marketplace. This is Overseas Contingency Operations (OCO) funding.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>
Previous President's Budget	5.973	8.458	9.212	0.000	9.212
Current President's Budget	5.973	35.458	19.739	0.000	19.739
Total Adjustments	0.000	27.000	10.527	0.000	10.527
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	27.000	10.527	0.000	10.527

**Change Summary Explanation**

The FY17 Request for Additional Appropriations (RAA) increase of \$27M is to support the Counter Small Unmanned Aerial Systems (Cs-UAS) JEON for \$16M and Cs-UAS JUON for \$11M.

The FY18 funding increase of \$10.5M is to support the Cs-UAS JEON.

<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<p><b>Title:</b> Integrated Base Defense Security Systems (IBDSS)</p> <p><b>Description:</b> IBDSS qualifies, demonstrates, and tests Physical Security Equipment (PSE) systems to include Force Protection. This continuing effort was previously named Physical Security Equipment.</p> <p><b>FY 2016 Accomplishments:</b> Continued with Force Protection Commercial Off The Shelf (COTS) market research, evaluation and testing to address capability gaps and obsolescence. This included integration and testing to qualify COTS equipment to provide essential upgrades/improvements and state-of the art technology to support integrated based security systems installations worldwide. Type of technologies included delay/denial/detection/assessment/communication display/access control/power equipment &amp; systems for IBDSS projects.</p> <p>Continued with previously integrated or modified COTS efforts to improve IBDSS physical security equipment:                      - Balanced Magnetic Switch sensor (BMS)                      - Command, control, Detection, Equipment (CCDE) Spec Development                      - Ceiling/Wall Mount Sensors (Volumetric)</p>	5.973	1.468	-

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<ul style="list-style-type: none"> <li>- Fence Sensors</li> <li>- Infrared Perimeter Intrusion Detection</li> <li>- Internal Sensors</li> <li>- Next Generation WISTI/LRTI equivalents</li> <li>- Qualification and integration of Ground Based Radars</li> <li>- Wide area Infrared System for Persistent Surveillance (WISP) demonstration</li> <li>- Denial capability integration to improve life cycle cost and effectiveness for the Remote Target Engagement System (RTES)</li> <li>- Conduct RTES Independent Validation and Verification (IV&amp;V) and safety reviews with NNMSB and applicable safety agencies to assure OSS&amp;E of developed systems</li> </ul> <p><b>FY 2017 Plans:</b> Includes, but not limited to continuing Force Protection Commercial Off The Shelf (COTS) market research, evaluation and testing to address capability gaps and obsolescence. This includes integration and testing to qualify COTS equipment to provide essential upgrades/improvements and state-of-the-art technology to support integrated based security systems installations worldwide. Type of technologies includes delay/denial/detection/assessment/communication display/access control/power equipment &amp; systems for IBDSS projects.</p> <p>Will continue with previously integrated or modified COTS efforts to improve IBDSS physical security equipment:</p> <ul style="list-style-type: none"> <li>- Market research:               <ul style="list-style-type: none"> <li>-- Cameras for obscured views</li> <li>-- Counter Small Unmanned Aerial System (CsUAS)</li> <li>-- Waterside Security</li> <li>-- Narrow Width Intrusion Detection Sensors</li> <li>-- Explosion Proof/intrinsically Safe Sensor</li> <li>-- Rollup Door Floor Mount Balanced Magnetic Switch Sensor</li> <li>-- Replacement for Long Range Passive Infrared Sensors (PIR)</li> <li>-- Nuclear vault Door</li> </ul> </li> <li>-Additional DT&amp;E on Annunciators</li> <li>- Continue Tactical Automated Security System (TASS)(also known as Tactical Security System) efforts including improvements to the annunciator.</li> <li>- Conduct RTES Independent Validation and Verification (IV&amp;V) and safety reviews with NNMSB and applicable safety agencies to assure OSS&amp;E of developed systems</li> </ul>				
<b>Title:</b> IBDSS-1		-	6.990	9.239

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
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**Description:** IBDSS (Integrated Base Defense Security Systems) qualifies, demonstrates, and tests Physical Security Equipment (PSE) systems to include Force Protection. This continuing effort was previously named Physical Security Equipment.

**FY 2017 Plans:**  
Includes, but not limited to continuing Force Protection Commercial Off The Shelf (COTS) market research, evaluation and testing to address capability gaps and obsolescence. This includes integration and testing to qualify COTS equipment to provide essential upgrades/improvements and state-of the art technology to support integrated based security systems installations worldwide. Type of technologies includes delay/denial/detection/assessment/communication display/access control/power equipment & systems for IBDSS projects.

Will continue previous integrated or modified COTS efforts to improve IBDSS physical security equipment:

- Continue Tactical Automated Security System (TASS)(also known as Tactical Security System) efforts including improvements to the annunciator.
- Integrate and test:
  - Counter Small Unmanned Aerial System (CsUAS)
  - Waterside Security
  - Ground Based Radars (GBRs)
  - Narrow Width Intrusion Detection Sensors
  - Explosion Proof/intrinsically Safe Sensor
  - Rollup Door Floor Mount Balanced Magnetic Switch Sensor
  - Replacement for Long Range Passive Infrared Sensors
- Conduct analyses to include the adversary needs assessment and System Effectiveness Assessment (SEA) of the Nuclear Environment.
- Qualify Physical Security Alarm Systems; identify, integrate and evaluate fusion and display capability to improve command, control and communication to include fusion of disparate sensor technologies and threat indicators; imp ...

**FY 2018 Plans:**  
Includes, but not limited to continuing Force Protection Commercial Off The Shelf (COTS) market research, evaluation and testing to address capability gaps and obsolescence. This includes integration and testing to qualify COTS equipment to provide essential upgrades/improvements and state-of the art technology to support integrated based security systems installations worldwide. Type of technologies includes delay/denial/detection/assessment/communication display/access control/power equipment & systems for IBDSS projects.

Continue with previous integrated or modified COTS efforts to improve IBDSS physical security equipment:

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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 5: System Development &amp; Demonstration (SDD)</i>		<b>R-1 Program Element (Number/Name)</b> PE 0604287F / <i>Physical Security Equipment</i>		
<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
<ul style="list-style-type: none"> <li>- Purchasing and installing Video Analytics</li> <li>- Re-compete Command, Control, Detection, Equipment (CCDE)effort</li> <li>- Test and integrate Ground Base Radars (GBRs)</li> <li>- Continue Tactical Automated Security System (TASS)(also known as Tactical Security System)</li> <li>- Market research replacement for Long Range Passive Infrared Radar (PIR)</li> <li>- Purchase and installing Cameras for obscured views</li> <li>- Conduct analyses to include the adversary needs assessment and System Effectiveness Assessment (SEA) of the Nuclear Environment.</li> <li>- Qualify Physical Security Alarm Systems; identify, integrate and evaluate fusion and display capability to improve command, control and communication to include fusion of disparate sensor technologies and threat indicators.</li> </ul>				
<p><b>Title:</b> Counter Small Unmanned Aerial Systems (Cs-UAS) Joint Emergent Operational Need (JEON)</p> <p><b>Description:</b> Counter Small Unmanned Aerial Systems (Cs-UAS) Joint Emergent Operational Need (JEON) is a rapid acquisition and deployment capability existing of full kill (detect, track, assess and defeat with various capabilities (fixed, mobile, portable and hand-held.) It is a layered system-of-systems using COTS technologies, integrated via GOTS C2 system.</p> <p><b>FY 2017 Plans:</b> Continue Communication and Control (C2) and Fixed-Site DT/OT</p> <p><b>FY 2018 Plans:</b> Complete Communication and Control (C2) and Fixed-Site DT/OT.</p>		-	16.000	10.500
<p><b>Title:</b> Counter Small Unmanned Aerial Systems (Cs-UAS) Joint Urgent Operational Need (JUON)</p> <p><b>Description:</b> Counter Small Unmanned Aerial Systems (Cs-UAS) Joint Emergent Operational Need (JEON) is a rapid acquisition and deployment capability existing of full kill (detect, track, assess and defeat with various capabilities (fixed, mobile, portable and hand-held.) It is a layered system-of-systems using COTS technologies, integrated via GOTS C2 system.</p> <p><b>FY 2017 Plans:</b> Begins integration of Cs-UAS component to achieve System of System (SoS) threshold and objective requirements</p> <ul style="list-style-type: none"> <li>- Research, demo and test new or updated component that better meet user needs and system performance specifications</li> <li>- Radar integration and testing to ensure performance meet COCOM and USAF requirement</li> <li>- Electronic Warfare sub system integration and testing to ensure OSS&amp;E authorities are met with not unintended electronic/frequency fratricide</li> </ul>		-	11.000	-

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>
- Continued development and integration of Cs-UAS Command and Control, to include but not limited to the adaptation of existing C2 systems and networking of Cs-UAS systems into the larger USAF C2 construct at the tactical and operational level - Develop and integrate Cs-UAS capabilities into a Force Protection, integrated Defense Common Operations Picture (COP) - Research, develop, test & integrate ground based kinetic and non-kinetic defeat modalities to Cs-UAS - Research, development, test and ion friendly "blue force" small unmanned aerial systems" to detect, track, ID and defeat red force/enemy UAVs - Fund technical subject matter expertise to perform RDT&E supporting Cs-UAS - Build and manage a systems integration lab (SIL) at an AF test site to be determined			
<b>Accomplishments/Planned Programs Subtotals</b>	5.973	35.458	19.739

<b>D. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018 Base</b>	<b>FY 2018 OCO</b>	<b>FY 2018 Total</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• OPAF: BA03: Line Item #29: <i>Base Physical Security Systems</i>	75.849	230.982	166.437	0.000	166.437	92.679	76.406	50.241	0.000	Continuing	Continuing

**Remarks**

**E. Acquisition Strategy**

AFSFC and Force Protection program office investigates requirements to include new and/or obsolete items. COTS sub-systems, equipment and components are competitively acquired from industry after thorough market research. Equipment for testing is purchased via competitive selection processes via direct purchase orders. For security systems COTS that are required to be qualified for nuclear security environments where industry COTS sources may not be mature, consideration is given to replacement of new items or modification of COTS through the competitive selection procedure as well.

Counter Small Unmanned Aerial Systems (Cs-UAS) Joint Emergent Operational Need (JEON). The Force Protection program office is acquiring COTS sub-systems and equipment for DT/OT as well as minor development of an existing C2 System for integration.

Counter Small Unmanned Aerial Systems (Cs-UAS) Joint Urgent Operational Need (JUON). The Force Protection program office is acquiring COTS sub-systems and equipment in support of EUCOM JUON for DT/OT as well as minor development of an existing C2 System for integration.

Delivery Orders on Indefinite Delivery/Indefinite Quantity contract vehicles or other approved purchase methods are utilized to acquire equipment.

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**Appropriation/Budget Activity**  
3600: *Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)*

**R-1 Program Element (Number/Name)**  
PE 0604287F / *Physical Security Equipment*

**F. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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**Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force** **Date:** May 2017

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604287F / <i>Physical Security Equipment</i>	<b>Project (Number/Name)</b> 655120 / <i>Physical Security Equipment - SD ED</i>
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<b>Product Development (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integrated Base Defense Security Systems (IBDSS)	Various	Various : Various	-	5.506		1.468		0.000		0.000		0.000	Continuing	Continuing	-
Integrated Base Defense Security Systems (IBDSS-1)	Various	Various : Various	-	0.000		4.832		5.801		0.000		5.801	Continuing	Continuing	-
Counter Small Unmanned Aerial Systems (CsUAS) Joint Emergent Operational Need (JEON)	Various	Various : Various	-	0.000		16.000		9.747		0.000		9.747	Continuing	Continuing	-
Counter Small Unmanned Aerial Systems (CsUAS) Joint Urgent Operational Need (JUON)	Various	Various : Various	-	0.000		11.000		0.000		0.000		0.000	Continuing	Continuing	-
<b>Subtotal</b>			-	5.506		33.300		15.548		0.000		15.548	-	-	-

<b>Support (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integrated Base Defense Security Systems (IBDSS)	Various	Various : Various	-	0.467		0.000		0.000		0.000		0.000	Continuing	Continuing	-
Integrated Base Defense Security Systems (IBDSS-1)	Various	Various : Various	-	0.000		0.857		0.857		0.000		0.857	Continuing	Continuing	-
<b>Subtotal</b>			-	0.467		0.857		0.857		0.000		0.857	-	-	-

**Remarks**  
 The support funding is planned at the above amounts. If the support contracts are less, the available funds will be transitioned to the Product Development line.

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: FY 2018 Air Force</b>											<b>Date: May 2017</b>		
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Demonstration and Test	PO	TAC-3 : TBD	-	0.000		1.301		2.581		0.000		2.581	Continuing	Continuing	-
Demonstration and Test: (CsUAS)	MIPR	Not specified. : TBD	-	0.000		0.000		0.753		0.000		0.753	Continuing	Continuing	-
<b>Subtotal</b>			-	0.000		1.301		3.334		0.000		3.334	-	-	-

<b>Management Services (\$ in Millions)</b>				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
<b>Subtotal</b>			-	-		-		-		-		-	-	-	-

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>			-	5.973	35.458	19.739	0.000	19.739	-	-	-

**Remarks**  
 Various delivery orders will be awarded throughout the fiscal year for numerous projects.



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<b>Exhibit R-4A, RDT&amp;E Schedule Details: FY 2018 Air Force</b>		<b>Date: May 2017</b>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Integrated Base Defense Security Systems (IBDSS)	1	2017	4	2018
Integrated Base Defense Security Systems (IBDSS-1)	1	2018	4	2019
Counter Small Unmanned Aerial Systems (CsUAS) Joint Emergent Operational Need (JEON) C2 and Fixed Site	1	2018	3	2018
Counter Small Unmanned Aerial Systems (CsUAS) Joint Urgent Operational Need (JUON) C2 and Fixed Site	3	2017	4	2018