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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2019 Air Force	<b>Date:</b> February 2018
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<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>											
3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 7: Operational Systems Development</i>	PE 0208088F / AF Defensive Cyberspace Operations											
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	-	38.035	20.964	24.166	0.000	24.166	23.542	16.819	14.594	14.859	Continuing	Continuing
677820: <i>Computer Security RDTE: Firestarter</i>	-	14.151	6.252	6.308	0.000	6.308	6.424	6.536	6.672	6.793	Continuing	Continuing
677821: <i>Cyberspace Vulnerability Assessment</i>	-	22.378	13.176	16.293	0.000	16.293	15.518	8.655	6.261	6.375	Continuing	Continuing
677822: <i>Cyber Defense Analysis</i>	-	0.258	0.265	0.268	0.000	0.268	0.274	0.279	0.285	0.290	Continuing	Continuing
677823: <i>AFCERT</i>	-	1.248	1.271	1.297	0.000	1.297	1.326	1.349	1.376	1.401	Continuing	Continuing

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

AF Defensive Cyberspace Operations (AF DCO) provides defensive cyber capabilities that protect the AFNET and DoD network enclaves, to include their associated computer systems, software applications and sensitive operational information against unauthorized intrusion, corruption, and/or destruction. The emphasis of the program is directed toward defensive cyberspace capabilities; computer and network systems security; damage assessment and recovery; cyber threat recognition, attribution, and mitigation; and active response methodologies in response to evolving threats and changes to cyber environment. These areas of emphasis are realized through research and development, test and acquisition in the areas of proactive defense, defensive counter cyberspace, cyberspace intelligence, surveillance and reconnaissance, command and control situational awareness, persistent network operations, as well as decision support, recovery, and digital forensics.

Firestarter utilizes cyber and Information Assurance (IA) technology investments by US Cyber Command, the Defense Advanced Research Projects Agency (DARPA), the National Security Agency (NSA), Director of National Intelligence (DNI), Intelligence Advanced Research Projects Activity (IARPA), and the Department of Homeland Security (DHS), and various government research laboratories, to jump-start its development of solutions to existing Air Force cyber and IA requirements. This program supports AF Space Command's Cyberspace strategic direction in support of Cyber Defense which provides capabilities to 24th AF, as AF component to Cyber Command (CYBERCOM), Defense Information Systems Agency (DISA), National Security Agency (NSA), and other services to ensure Global Information Grid (GIG) cyber and IA requirements are being met. Activities performed include those designed to identify, analyze, test, rapidly acquire, and integrate emerging IA and cyber technology and defensive cyberspace weapons systems and capabilities into all regions of the GIG - terrestrial, airborne, and space systems. In addition, this effort will support implementation of DoD Enterprise-wide IA & Computer Network Defense (CND) Solutions Steering Group (ESSG) solutions. Current Air Force systems, such as the AFNET NIPRNet Gateways, SIPRNet Modernization program, and Host Based Security System leverage this technology to meet their information assurance and defensive cyberspace needs/requirements.

Cyberspace Vulnerability Assessment/ Hunter Team (CVA/H) weapon system develops new capabilities to provide Air Force Cyber Command (AFCYBER) and Combatant Commanders additional mobile precision in addition to currently fielded protection capabilities to identify, pursue, and mitigate cyberspace threats. The CVA/H weapon system performs defensive sorties world-wide via remote or on-site access. CVA/H executes vulnerability, compliance, defense and non-technical assessments, best practice reviews, penetration testing and Hunter missions on AF and DoD networks & systems. Hunter operations characterize and then eliminate

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<p>threats for the purpose of mission assurance. The Hunter mission focuses on the capability to find, fix, track, target, engage, and assess (F2T2EA) the advanced weapon system to meet scope and scale of the USCYBERCOM directed Cyber Protection Teams.</p> <p>Cyberspace Defense Analysis (CDA) is an assessment of non-secure telecommunications to determine type and amount of sensitive and/or classified information that may have been disclosed to our adversaries and encompasses the following mission subsets: Telephony Communications, Radio Frequency (RF) Communications, E-mail Communications, Internet based Capabilities (IbC), Web Risk Assessment (WRA), and Cyber Operations Risk Assessment (CORA). CDA is the cyberspace weapon system that is used to conduct assessments during peace time and contingency operations. CDA shows its true capability in the force protection realm and helps ensure our adversaries are not provided early warning of our plans, capabilities, or limitations.</p> <p>AF Computer Emergency Response Team (AFCERT) supports the AF Cyberspace Defense (ACD) weapon system and is designed to prevent, detect, and respond to adversarial penetration into AF unclassified and classified networks. ACD supports Air Force and Combatant Commanders by conducting synchronized Defensive Cyber Operations (DCO) and providing 24/7/365 monitoring and defense of USAF and US Central Command Secure/Non-secure Internet Protocol Router Network (SIPRNET/NIPRNET) systems against hostile attack. Daily intrusions to the AF network are analyzed in a forensics manner to identify a multitude of counter defensive and defensive tools and techniques that are required to truly strengthen cyber security. The Air Force Research Laboratory (AFRL) and other Federal R&amp;D entities often have cutting edge solutions, that, with 3600 funding, can be taken to the technology readiness level (TRL) needed for rapid deployment as new capability to counter critical cyber weapon system vulnerabilities. AFCERT funding for this effort will focus on development of capability, capacity, and potential modifications to increase the utility of the ACD weapon system to the warfighter as well as testing requirements for new capabilities.</p> <p>Activities include studies and analysis to support both current program planning and execution and future program planning.</p> <p>This program element may include necessary civilian pay expenses required to manage, execute, and deliver Air Defensive Cyberspace Operations weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F</p> <p>This program is in Budget Activity 7, Operational System Development, because this budget activity includes development efforts to upgrade systems that been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.</p>		

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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0208088F I AF Defensive Cyberspace Operations			
B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	29.439	20.964	26.888	0.000	26.888
Current President's Budget	38.035	20.964	24.166	0.000	24.166
Total Adjustments	8.596	0.000	-2.722	0.000	-2.722
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	10.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-1.404	0.000	-2.722	0.000	-2.722
Change Summary Explanation					
Program increase					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations				Project (Number/Name) 677820 / Computer Security RDTE: Firestarter			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
677820: Computer Security RDTE: Firestarter	-	14.151	6.252	6.308	0.000	6.308	6.424	6.536	6.672	6.793	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

## A. Mission Description and Budget Item Justification

The Firestarter program provides newly improved capabilities and technical transition opportunities for Cyber Defense and Information Assurance (IA) technologies and tools needed to defend Air Force Command, Control, Communications, Computer, and Intelligence (C4I) systems from Cyber-attacks, while ensuring recovery in the event of an attack. The emphasis of the program is directed toward defensive cyberspace capabilities; computer and network systems security; damage assessment and recovery; cyber threat recognition, attribution, and mitigation; and active response methodologies in response to evolving threats and changes to cyber environment. These areas of emphasis are realized through research and development, test and acquisition in the areas of proactive defense, defensive counter cyberspace, cyberspace intelligence, surveillance and reconnaissance & situational awareness, persistent network operations, as well as decision support, recovery, and digital forensics. Current Air Force systems, such as the AFNET NIPRNet Gateways, SIPRNet Modernization program, and Host Based Security System leverage this technology to meet their information assurance and defensive cyberspace needs/requirements.

Firestarter utilizes cyber and IA technology investments by US Cyber Command, the Defense Advanced Research Projects Agency (DARPA), the National Security Agency (NSA), Director of National Intelligence (DNI), Intelligence Advanced Research Projects Activity (IARPA), and the Department of Homeland Security (DHS), and various government research laboratories, to jump-start its development of solutions to existing Air Force cyber and IA requirements. This program supports AF Space Command's Cyberspace strategic direction in support of Cyber Defense which provides capabilities to 24th AF, as AF component to Cyber Command (CYBERCOM), Defense Information Systems Agency (DISA), National Security Agency (NSA), and other services to ensure Global Information Grid (GIG) cyber and IA requirements are being met. Activities performed include those designed to identify, analyze, test, rapidly acquire, and integrate emerging IA and cyber technology and defensive cyberspace weapons systems and capabilities into all regions of the GIG - terrestrial, airborne, and space systems. In addition, this effort will support implementation of DoD Enterprise-wide Information Assurance (IA) & Computer Network Defense (CND) Solutions Steering Group (ESSG) solutions.

## B. Accomplishments/Planned Programs (\$ in Millions)

	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>
<b>Title:</b> Cyber Forensic Tools & Methodologies	1.427	1.638	1.612
<b>Description:</b> Cyber forensic tools & methodologies. Includes initial metrics for reliable info assurance; secure coalition cyber data management, collaboration and visualization; analysis of cyber security bots			
<b>FY 2018 Plans:</b> - Continue the development, enhancement, and transition of incident response data gathering and attack attribution technologies			
<b>FY 2019 Plans:</b>			

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Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677820 / Computer Security RDTE: Firestarter		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
- Will continue the development, enhancement, and transition of incident response data gathering and attack attribution technologies				
FY 2018 to FY 2019 Increase/Decrease Statement: N/A				
Title: Cyber Threat Recognition		9.909	1.821	1.711
Description: Enhancing cyber platform technology to identify zero-day threats in real time.				
FY 2018 Plans: - Continue to normalize and automate methods and procedures to identify zero day cyber threats prior to system compromise				
FY 2019 Plans: - Will continue to normalize and automate methods and procedures to identify zero day cyber threats prior to system compromise				
FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to another higher priority				
Title: Cyber Threat Attribution & Mitigation		1.710	1.494	1.686
Description: Includes risk mitigation techniques for wireless networks and systems; active response, dynamic policy enforcement and computer/net attack attribution efforts.				
FY 2018 Plans: - Continue to mature, enhance, and integrate developmental concepts to attribute cyber patterns, techniques, behaviors, and signatures to specific threat actors and identify mitigation strategies for each				
FY 2019 Plans: - Will continue to mature, enhance, and integrate developmental concepts to attribute cyber patterns, techniques, behaviors, and signatures to specific threat actors and identify mitigation strategies for each				
FY 2018 to FY 2019 Increase/Decrease Statement: N/A				
Title: Transition of Cyber and Information Assurance Technologies		1.105	1.299	1.299
Description: Transition cyber defense technologies that support AFSPC's Defense architecture. Includes space systems cyber solutions; terrestrial net defense technology development; airborne IP network cyber and IA tools; IA/cyber modeling & simulation; secure interoperable distributed agent computing, and others that relate to defending the AF networks.				

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<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0208088F / AF Defensive Cyberspace Operations	<b>Project (Number/Name)</b> 677820 / Computer Security RDTE: Firestarter	
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2017</b>	<b>FY 2018</b>
<b>FY 2018 Plans:</b> - Continue enhancing and transitioning customer funded cyber and IA technology to operational USAF components in accordance with rapid requirements documentation provided by AFSPC  <b>FY 2019 Plans:</b> - Will continue enhancing and transitioning customer funded cyber and IA technology to operational USAF components in accordance with rapid requirements documentation provided by AFSPC  <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> N/A			
<b>Accomplishments/Planned Programs Subtotals</b>		14.151	6.252
<b>C. Other Program Funding Summary (\$ in Millions)</b>			
N/A			
<b>Remarks</b>			
<b>D. Acquisition Strategy</b>			
Firestarter conducts late stage Science and Technology (S&T) for tech demo and tech transition to warfighter employment. All contracts within this project are awarded using full and open competition and utilize evolutionary capability and incremental development. Where appropriate, collaborative efforts are conducted with services and agencies within the USAF to result in more robust and cost effective solutions. Contracting activities are primarily done through other agencies when deemed more advantageous. All aspects of the Firestarter project are managed by the Air Force Research Laboratory.			
<b>E. Performance Metrics</b>			
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: PB 2019 Air Force												Date: February 2018			
Appropriation/Budget Activity 3600 / 7						R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations				Project (Number/Name) 677820 / Computer Security RDTE: Firestarter					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing	C/CPFF	Various : Various	-	0.873	Jan 2017	1.395	Jan 2018	1.369	Jan 2019	-		1.369	Continuing	Continuing	-
Development	C/CPFF	Various : Various	-	11.702	Jan 2017	3.136	Jan 2018	3.218	Jan 2019	-		3.218	Continuing	Continuing	-
Integration	C/CPFF	Various : Various	-	1.140	Jan 2017	1.271	Jan 2018	1.271	Jan 2019	-		1.271	Continuing	Continuing	-
Subtotal			-	13.715		5.802		5.858		-		5.858	Continuing	Continuing	N/A
Remarks															
Multiple contractors and multiple universities reflect on-going efforts with over a dozen contractors and universities. Each has a different contract date depending on when that particular contract was awarded.															
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA	C/CPFF	Various : Various	-	0.436	Jan 2017	0.450	Jan 2018	0.450	Jan 2019	-		0.450	Continuing	Continuing	-
Subtotal			-	0.436		0.450		0.450		-		0.450	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	14.151		6.252		6.308		-		6.308	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force												Date: February 2018			
Appropriation/Budget Activity 3600 / 7								R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations				Project (Number/Name) 677820 / Computer Security RDTE: Firestarter			

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Firestarter																												
Cyber Forensic Tools & Methodologies																												
Cyber Threat Recognition																												
Cyber Threat Attribution & Mitigation																												
Transition of Cyber/IA Technologies																												



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Air Force			<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0208088F / AF Defensive Cyberspace Operations	<b>Project (Number/Name)</b> 677820 / Computer Security RDTE: Firestarter	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Firestarter</i></b>				
Cyber Forensic Tools & Methodologies	1	2017	4	2023
Cyber Threat Recognition	1	2017	4	2023
Cyber Threat Attribution & Mitigation	1	2017	4	2023
Transition of Cyber/IA Technologies	1	2017	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations				Project (Number/Name) 677821 / Cyberspace Vulnerability Assessment			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
677821: Cyberspace Vulnerability Assessment	-	22.378	13.176	16.293	0.000	16.293	15.518	8.655	6.261	6.375	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This requirement supports the Cyberspace Vulnerability Assessment / Hunter Team (CVA/H) weapon system development of new capabilities to provide Air Force Cyber Command (AFCYBER) and Combatant Commanders additional mobile precision in addition to currently fielded protection capabilities to identify, pursue, and mitigate cyberspace threats. The CVA/H weapon system performs defensive sorties world-wide via remote or on-site access. CVA/H executes vulnerability, compliance, defense and non-technical assessments, best practice reviews, penetration testing and Hunter missions on AF and DoD networks & systems. Hunter operations characterize and then eliminate threats for the purpose of mission assurance. The Hunter mission focuses on the capability to find, fix, track, target, engage, and assess(F2T2EA) the advanced persistent threat (APT). This effort funds development efforts to enhance command and control situational awareness and to expand the capability of the current weapon system to meet scope and scale of the USCYBERCOM directed Cyber Protection Teams.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: Cyber Threat Mitigation									7.239	2.203	0.850	
Description: Cyber Threat Mitigation includes vulnerability, compliance, defense and non-technical assessments, best practice reviews, penetration testing and supports Cyberspace Vulnerability Assessment/Hunter (CVA/H) missions in support of Air Force Cyber Command and Combatant Commanders.												
FY 2018 Plans: - Continue modernization of CVA/H weapon system with emerging technologies to keep pace with an evolving cyber threat - Continue development of technologies to conduct vulnerability assessments, network intrusion analysis and systems vulnerability analysis (i.e, malware analysis capability, forensic analysis, visual analysis environment, distributed source code control vault and mission oriented mapping)												
FY 2019 Plans: - Will continue development of technologies to conduct vulnerability assessments, network intrusion analysis and systems vulnerability analysis.												
FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased from FY18 to FY19 due to reduction in vulnerability assessments.												
Title: Defensive Next Generation Development									14.719	9.973	14.443	

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Air Force							<b>Date:</b> February 2018				
<b>Appropriation/Budget Activity</b> 3600 / 7				<b>R-1 Program Element (Number/Name)</b> PE 0208088F / AF Defensive Cyberspace Operations			<b>Project (Number/Name)</b> 677821 / Cyberspace Vulnerability Assessment				
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>							<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>		
<b>Description:</b> Development of solutions supporting defensive cyber modernization and AF Cyber Needs Forms in the area of DCO capabilities and technologies to meet capability gaps required by Cyber Protection Teams.  <b>FY 2018 Plans:</b> - Continue providing solutions to support modernization of DCO capabilities and technologies to support Cyber Protection Teams (CPTs); includes multiple efforts (i.e., Data and Analysis and Traffic Inspection of SSL)  <b>FY 2019 Plans:</b> - Will continue development to support modernization of DCO capabilities and technologies to support Cyber Protection Teams (CPTs).  <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> Funding increase in FY19 to support development training solutions for modernization of capabilities.											
<b>Title:</b> Test & Evaluation  <b>Description:</b> Test and Evaluation provides both developmental testing of new development capabilities and a network environment for testing.  <b>FY 2018 Plans:</b> - Continue to provide the required developmental testing for new platform, access, and capability products prior to fielding  <b>FY 2019 Plans:</b> - Will continue developmental testing for of DCO capability products and technologies prior to fielding.  <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> N/A							0.420	1.000	1.000		
<b>Accomplishments/Planned Programs Subtotals</b>							22.378	13.176	16.293		
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• OPAF 03 Line Item 831010: COMSEC Equipment	19.878	19.126	25.318	-	25.318	21.222	21.613	25.002	25.446	Continuing	Continuing
<b>Remarks</b>											

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<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0208088F / AF Defensive Cyberspace Operations	<b>Project (Number/Name)</b> 677821 / Cyberspace Vulnerability Assessment

### D. Acquisition Strategy

The Cyberspace Vulnerability Assessment/Hunter (CVA/H) program office will utilize Concept, Development, Risk Management, or Production and Deployment Plans as part of a phased approach to acquisition planning. All plans will contain sufficient information for the Milestone Decision Authority (MDA) to determine readiness to enter into the applicable phase of the acquisition process. CVA/H Program office will utilize both new and existing contractual vehicles, in addition to existing Government-Wide Acquisition Contract (GWAC) vehicles (i.e., Alliant, Encore II, Solutions for Enterprise-Wide Procurement IV (SEWP IV), and General Services Administration (GSA) Federal Supply Schedules, Network-Centric Solutions (NETCENTS)).

### E. 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: PB 2019 Air Force												Date: February 2018			
Appropriation/Budget Activity 3600 / 7						R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations				Project (Number/Name) 677821 / Cyberspace Vulnerability Assessment					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber Threat Mitigation-Malware Analysis	C/FFP	Various : Various	-	3.200	Jun 2017	-		-		-		-	Continuing	Continuing	-
Cyber Threat Mitigation - Forensic Analysis	C/FFP	Various : Various	-	1.617	Jun 2017	-		-		-		-	Continuing	Continuing	-
Cyber Threat Mitigation - Visual Analysis Enviroment	C/FFP	Various : Various	-	0.120	Mar 2017	-		-		-		-	Continuing	Continuing	-
Cyber Threat Mitigation - Distributed Source Code Control Vault	C/FFP	Various : Various	-	0.177	May 2017	-		-		-		-	Continuing	Continuing	-
Cyber Threat Mitigation - Mission Oriented Mapping	C/CPFF	Various : Various	-	2.125	Jan 2017	0.800	Jan 2018	0.850	Jan 2019	-		0.850	Continuing	Continuing	-
Defensive Next Gen - Data & Analysis	C/CPFF	Various : Various	-	8.105	Mar 2017	1.643	Mar 2018	1.950	Mar 2019	-		1.950	Continuing	Continuing	-
Defensive Next Gen - Training Simulator	C/FFP	Various : Various	-	5.440	Apr 2017	5.000	Apr 2018	7.377	Apr 2019	-		7.377	Continuing	Continuing	-
Defensive Next Gen - Disc Forensics Solution	C/FFP	Various : Various	-	-		1.133	Mar 2018	1.650	Mar 2019	-		1.650	Continuing	Continuing	-
Defensive Next Gen - Data Collection and Correlation	C/FFP	Various : Various	-	-		1.226	Mar 2018	1.092	Mar 2019	-		1.092	Continuing	Continuing	-
Defensive Next Gen - Cloudshield Capabilities	C/FFP	Various : Various	-	-		1.200	Aug 2018	1.200	Aug 2019	-		1.200	Continuing	Continuing	-
Subtotal			-	20.784		11.002		14.119		-		14.119	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	46 Test Squadron : Eglin, FL	-	0.420	Oct 2016	1.000	Oct 2017	1.000	Oct 2018	-		1.000	Continuing	Continuing	-
Subtotal			-	0.420		1.000		1.000		-		1.000	Continuing	Continuing	N/A

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2019 Air Force												<b>Date:</b> February 2018			
<b>Appropriation/Budget Activity</b> 3600 / 7						<b>R-1 Program Element (Number/Name)</b> PE 0208088F / AF Defensive Cyberspace Operations				<b>Project (Number/Name)</b> 677821 / Cyberspace Vulnerability Assessment					

  

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMA - Engineering & Technical Asisstance Support Services (ETASS & FFRDC)	Various	AFLCMC/PZ : Bedford, MA	-	1.174	Jan 2017	1.174	Jan 2018	1.174	Jan 2019	-		1.174	Continuing	Continuing	-
<b>Subtotal</b>			-	1.174		1.174		1.174		-		1.174	Continuing	Continuing	N/A

  

**Remarks**  
Provides program engineering continuity, technical maturation and expertise, and access to an extensive professional network for future capabilities.

  

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	-	22.378	13.176	16.293	-	16.293	Continuing	Continuing	N/A

  

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2019 Air Force			<b>Date:</b> February 2018		
<b>Appropriation/Budget Activity</b> 3600 / 7		<b>R-1 Program Element (Number/Name)</b> PE 0208088F / AF Defensive Cyberspace Operations			<b>Project (Number/Name)</b> 677821 / Cyberspace Vulnerability Assessment

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Cyber Vulnerability Assessment</b>																												
Cyber Threat Mitigation (Malware Analysis)																												
Cyber Threat Mitigation (Forensic Analysis)																												
Cyber Threat (Visual Analysis Environment)																												
Cyber Threat Mitigation (Distributed Source Code Control Vault)																												
Cyber Threat Mitigation (Mission Oriented Mapping)																												
Defensive Next Generation Development (Data & Analysis)																												
Defensive Next Generation (Training Simulator)																												
Defensive Next Generation (10GB Through put)																												
Defensive Next Generation (Data Collection and Correlation)																												
Defensive Next Generation (Cloudshield Capabilities)																												
Test & Evaluation																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Air Force			<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 3600 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0208088F / <i>AF Defensive Cyberspace Operations</i>	<b>Project (Number/Name)</b> 677821 / <i>Cyberspace Vulnerability Assessment</i>	

**Schedule Details**

<b>Events by Sub Project</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
<b><i>Cyber Vulnerability Assessment</i></b>				
Cyber Threat Mitigation (Malware Analysis)	3	2017	3	2019
Cyber Threat Mitigation (Forensic Analysis)	3	2017	3	2019
Cyber Threat (Visual Analysis Environment)	2	2017	2	2019
Cyber Threat Mitigation (Distributed Source Code Control Vault)	3	2017	3	2019
Cyber Threat Mitigation (Mission Oriented Mapping)	2	2017	2	2019
Defensive Next Generation Development (Data & Analysis)	2	2017	4	2023
Defensive Next Generation (Training Simulator)	3	2017	4	2023
Defensive Next Generation (10GB Through put)	2	2018	4	2023
Defensive Next Generation (Data Collection and Correlation)	2	2018	4	2023
Defensive Next Generation (Cloudshield Capabilities)	4	2018	4	2023
Test & Evaluation	2	2017	4	2023



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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations				Project (Number/Name) 677822 / Cyber Defense Analysis			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
677822: Cyber Defense Analysis	-	0.258	0.265	0.268	0.000	0.268	0.274	0.279	0.285	0.290	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Cyberspace Defense Analysis (CDA) is an assessment of non-secure telecommunications to determine type and amount of sensitive and/or classified information that may have been disclosed to our adversaries and encompasses the following mission subsets: Telephony Communications, Radio Frequency (RF) Communications, E-mail Communications, Internet based Capabilities (IbC), Web Risk Assessment (WRA), and Cyber Operations Risk Assessment (CORA). CDA is the cyberspace weapon system that is used to conduct assessments during peace time and contingency operations. CDA shows its true capability in the force protection realm and helps ensure our adversaries are not provided early warning of our plans, capabilities, or limitations.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: Cyber Defense Analysis									0.258	0.265	0.268	
Description: Engineering support to conduct Cyberspace Defense Analysis (CDA) assessment of non-secure telecommunications during peace time and contingency operations.												
FY 2018 Plans: - Continue to support CDA technical maturation and development of technologies to prevent disclosure of sensitive and/or classified information to adversaries that attempt to penetrate our networks												
FY 2019 Plans: - Will continue to support CDA technical maturation and development of technologies to prevent disclosure of sensitive and/or classified information to adversaries that attempt to penetrate our networks												
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased to support development of technology												
Accomplishments/Planned Programs Subtotals									0.258	0.265	0.268	
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost	
• OPAF 03 Line Item 831010: COMSEC Equipment	0.244	3.940	1.259	-	1.259	1.698	1.702	10.498	10.685	0.000	30.026	

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Air Force										<b>Date:</b> February 2018	
<b>Appropriation/Budget Activity</b> 3600 / 7				<b>R-1 Program Element (Number/Name)</b> PE 0208088F / AF Defensive Cyberspace Operations				<b>Project (Number/Name)</b> 677822 / Cyber Defense Analysis			
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
			<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2019</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Complete</u>	<u>Total Cost</u>
<b>Remarks</b>											
<b>D. Acquisition Strategy</b>											
<p>The Cyberspace Defense Analysis (CDA) weapon system development of new capabilities to provide additional OPSEC protection capabilities to monitor, collect, analyze, and report cyberspace threats. The CDA program will utilize various contractual vehicles when necessary (i.e., Government-Wide Acquisition Contract (GWAC), Alliant, Encore II, Solutions for Enterprise-Wide Procurement IV (SEWP IV), and General Services Administration (GSA) Federal Supply Schedules, Network-Centric Solutions (NETCENTS) (mandatory for all IT services and supplies) and competitive contract (if required). The use of multiple-award contractual vehicles will provide a wide range of commercially-available products and services that should be able to meet requirements related to Defensive Cyberspace Operations.</p>											
<b>E. Performance Metrics</b>											
<p>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.</p>											

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2019 Air Force												<b>Date:</b> February 2018			
<b>Appropriation/Budget Activity</b> 3600 / 7						<b>R-1 Program Element (Number/Name)</b> PE 0208088F / AF Defensive Cyberspace Operations				<b>Project (Number/Name)</b> 677822 / Cyber Defense Analysis					

  

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost		Cost To Complete	Total Cost	Target Value of Contract
PMA - Engineering & Technical Assistance Support Services (ETASS & FFRDC)	Various	AFLCMC/PZ : Hanscom, MA	-	0.258	Jan 2017	0.265	Jan 2018	0.268	Jan 2019	-		0.268	Continuing	Continuing		-
<b>Subtotal</b>			-	0.258		0.265		0.268		-		0.268	Continuing	Continuing		N/A

  

**Remarks**  
Provides program office subject matter expertise, engineering continuity, technical maturation and expertise, and access to an extensive professional network for future capabilities.

  

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	-	0.258	0.265	0.268	-	0.268	Continuing	Continuing	N/A

  

**Remarks**

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force			Date: February 2018		
Appropriation/Budget Activity 3600 / 7		R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations		Project (Number/Name) 677822 / Cyber Defense Analysis	

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Cyber Defense Analysis																												
Cyber Defense Analysis (FFRDC)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677822 / Cyber Defense Analysis

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Cyber Defense Analysis				
Cyber Defense Analysis (FFRDC)	1	2017	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations				Project (Number/Name) 677823 / AFCERT			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
677823: AFCERT	-	1.248	1.271	1.297	0.000	1.297	1.326	1.349	1.376	1.401	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
AF Computer Emergency Response Team (AFCERT) supports the AF Cyberspace Defense (ACD) weapons system and is designed to prevent, detect, and respond to adversarial penetration into AF unclassified and classified networks. ACD supports Air Force and Combatant Commanders by conducting synchronized Defensive Cyber Operations (DCO) and providing 24/7/365 monitoring and defense of USAF and US Central Command Secure/Non-secure Internet Protocol Router Network (SIPRNET/NIPRNET) systems against hostile attack. Daily intrusions to the AF network are analyzed in a forensics manner to identify a multitude of counter defensive and defensive tools and techniques that are required to truly strengthen cyber security. The Air Force Research Laboratory (AFRL) and other Federal R&D entities often have cutting edge solutions, that, with 3600 funding, take them to the technology readiness level (TRL) needed for rapid deployment as new capabilities to counter critical cyber weapon system vulnerabilities. AFCERT funding for this effort will focus on development of capability, capacity, and potential modifications to increase the utility of the ACD weapon system to the warfighter as well as testing requirements for new capabilities.												
This program element may include necessary civilian pay expenses required to manage, execute, and deliver AF Cyber Defensive weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2017	FY 2018	FY 2019	
Title: Cyberspace Defense Development									1.248	1.271	1.297	
Description: Air Force Computer Emergency Response Team (AFCERT) prevention, detection, and response to adversarial penetration into AF unclassified and classified networks.												
FY 2018 Plans: - Develop and test technologies for the AF Cyberspace Defensive (ACD) weapon system to prevent, detect, and respond adversarial penetration in AF networks												
FY 2019 Plans: - Develop and test technologies for the AF Cyberspace Defensive (ACD) weapon system to prevent, detect, and respond adversarial penetration in AF networks												
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to inflation.												
Accomplishments/Planned Programs Subtotals									1.248	1.271	1.297	

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force										Date: February 2018	
Appropriation/Budget Activity 3600 / 7				R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations				Project (Number/Name) 677823 / AFCERT			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 03 Line Item 831010: COMSEC Equipment	0.242	-	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing
• OPAF 03 Line Item 835080: AFNET	7.736	30.914	31.543	-	31.543	23.660	24.069	33.578	34.182	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
The AF Cyberspace Defense (ACD) weapons system office will utilize existing contractual vehicles such as Massachusetts Institute of Technology Research and Engineering (MITRE), General Services Administration (GSA) Federal Supply Schedules, Air Force Research Laboratory (AFRL), Advisory and Assistance Services (A&AS) as well as various Test and Evaluation Enterprises. The ACD weapon system office also intends to utilize the commercial contracting community to lead the Development, Test and Integration of future Cyberspace Defense capabilities. The use of multiple-award contractual vehicles will provide a wide range of commercially-available products and services that should be able to meet many requirements related to the ACD mission.											
E. 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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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2019 Air Force												<b>Date:</b> February 2018			
<b>Appropriation/Budget Activity</b> 3600 / 7						<b>R-1 Program Element (Number/Name)</b> PE 0208088F / AF Defensive Cyberspace Operations						<b>Project (Number/Name)</b> 677823 / AFCERT			

  

<b>Product Development (\$ in Millions)</b>				<b>FY 2017</b>		<b>FY 2018</b>		<b>FY 2019 Base</b>		<b>FY 2019 OCO</b>		<b>FY 2019 Total</b>				
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>		<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Cyberspace Defense Development	Various	Various : Various	-	1.248	Feb 2017	1.271	Feb 2018	1.297	Feb 2019	-		1.297		Continuing	Continuing	-
<b>Subtotal</b>			-	1.248		1.271		1.297		-		1.297		Continuing	Continuing	N/A

  

	<b>Prior Years</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	-	1.248	1.271	1.297	-	1.297	Continuing	Continuing	N/A

  

**Remarks**



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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force										Date: February 2018									
Appropriation/Budget Activity 3600 / 7										R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations									
										Project (Number/Name) 677823 / AFCERT									

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Integrated Cyber Aggregation Tool																												
Cyberspace Defense Development																												
Test and Evaluation																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208088F / AF Defensive Cyberspace Operations	Project (Number/Name) 677823 / AFCERT

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Integrated Cyber Aggregation Tool</i>				
Cyberspace Defense Development	2	2017	2	2023
Test and Evaluation	3	2017	4	2023