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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0305251F I Cyberspace Operations Forces and Force Support							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	35.000	0.000	35.000	43.000	44.000	45.000	45.000	Continuing	Continuing
646008: US Cyber Command Technology Development	-	0.000	0.000	35.000	0.000	35.000	43.000	44.000	45.000	45.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

## Note

This program, BA 4, PE 0305251F, project 646008, CMF Foundational Tools, is a new start.

## A. Mission Description and Budget Item Justification

Foundational Tools provide advanced cyber warfare capabilities to the Air Force Cyber Mission Forces in direct support of US Cyber Command (USCYBERCOM), AF Major Commands (MAJCOMs), unified commands, and national agency cyber warfighting requirements. Activities within the program deliver operations-ready cyberspace superiority capabilities through the research, development, testing, evaluation, accelerated prototyping, demonstration, and fielding of cyber technologies and capabilities. This program enables Combatant Commanders the ability to operate in and through cyberspace to manipulate, disrupt, deny, degrade, or destroy targeted computers, information systems, and networks.

Capabilities prototyped and developed in this program are incorporated into the Air Force Distributed Cyber Warfare Operations (DCWO) portfolio. The DCWO portfolio enables delivery of cyber effects to Combatant Commanders to include cyber operational preparation of the environment, offensive counter-cyber, cyber-attack, electronic warfare operations, mission planning, intelligence, cybersecurity products and services and Command and Control/Situational Awareness (C2SA) tools needed to attack enemy networks, telephony, Integrated Air Defense Systems (IADS), command and control systems, and create cyber effects through the Electromagnetic Spectrum (EMS).

This program element may include necessary civilian pay expenses required to manage, execute, and deliver CMF Foundational Tool 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, 0605898F, and 0605833F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is \$14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	35.000	0.000	35.000
Total Adjustments	0.000	0.000	35.000	0.000	35.000
• 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	0.000	35.000	0.000	35.000
Change Summary Explanation					
FY20 increase for new start of Air Force CMF Foundational Tool program.					
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019
Title: CMF Foundational Tools				0.000	0.000
Description: The CMF Foundational Tools program develops a family of foundational cyber tool prototypes at scale ready for integration and operational test in the Distributed Cyber Warfare Operations (DCWO) portfolio. This effort equips the Air Force portion of the Cyber Mission Force support strategy, and significantly leverages joint partnerships with US Cyber Command, other service development offices, and other government agencies. Details of specific tool development efforts are classified and will be provided on a need to know basis. For further information please contact AFLCMC/HNCO, 210-925-6653.					35.000
FY 2019 Plans:					
N/A					
FY 2020 Plans:					
- Will expand FY18-FY19 USCYBERCOM-funded efforts to produce prioritized family of foundational tools					
- Will develop additional tool development software factories					
- Will transition and integrate available prototype tool kits to DCWO portfolio					
- Will deliver prototype tools into USCYBERCOM architecture to ensure interoperability					

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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>		<b>R-1 Program Element (Number/Name)</b> PE 0305251F <i>I Cyberspace Operations Forces and Force Support</i>		
<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>
- Will develop automated testing and information assurance support tools				
<b><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i></b> This program leverages previous USCYBERCOM and Air Force foundational tool development efforts. These efforts were funded in other programs and the FY20 funds in this program will address the expanded Air Force requirement to deliver diverse Cyber Mission Force foundational tools.				
<b>Accomplishments/Planned Programs Subtotals</b>		0.000	0.000	35.000
<b>D. Other Program Funding Summary (\$ in Millions)</b> N/A				
<b>Remarks</b>				
<b>E. Acquisition Strategy</b> The CMF foundational tools program is aligned within the Distributed Cyber Warfare Operations (DCWO) program office. This program serves to create foundational tool prototypes at scale to enable the DCWO program office to quickly integrate and transition those tools into available operational capability. The foundational tools program office will utilize Concept, Development, Risk Management, Production, or Deployment Plans as part of a streamlined 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. Foundational Tools prototyping efforts will be used in conjunction with the DCWO program to buy-down acquisitions risk and identify both new large-scale foundational efforts as well as short projects to leverage government and commercial solutions. The program will utilize both new and existing contractual vehicles, such as Government-Wide Acquisition Contract (GWAC) vehicles (Alliant, Encore II, Solutions for Enterprise-Wide Procurement IV (SEWP IV)), and General Services Administration (GSA) Federal Supply Schedules and a Cyber Indefinite Delivery Indefinite Quantity (IDIQ) contract. 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 Offensive Cyberspace Operations. These multiple-award contractual vehicles have already met the statutory requirements of the Competition in Contracting Act (CICA), which requires a fair opportunity to all contract holders, in accordance with Federal Acquisition Regulation (FAR) 16.505, unless an exception to fair opportunity applies.				
<b>F. 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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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2020 Air Force</b>												<b>Date:</b> February 2019			
<b>Appropriation/Budget Activity</b> 3600 / 4						<b>R-1 Program Element (Number/Name)</b> PE 0305251F / <i>Cyberspace Operations Forces and Force Support</i>						<b>Project (Number/Name)</b> 646008 / <i>US Cyber Command Technology Development</i>			
<b>Product Development (\$ in Millions)</b>				<b>FY 2018</b>		<b>FY 2019</b>		<b>FY 2020 Base</b>		<b>FY 2020 OCO</b>		<b>FY 2020 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>
CMF Foundational Tool Development	Various	Various : Various	-	-		-		22.200	Jan 2020	-		22.200	Continuing	Continuing	-
Interoperability Development	Various	Various : Various	-	-		-		3.100	Feb 2020	-		3.100	Continuing	Continuing	-
Automated Test Development	Various	Various : Various	-	-		-		3.000	Jan 2020	-		3.000	Continuing	Continuing	-
<b>Subtotal</b>			-	-		-		28.300		-		28.300	Continuing	Continuing	N/A
<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2018</b>		<b>FY 2019</b>		<b>FY 2020 Base</b>		<b>FY 2020 OCO</b>		<b>FY 2020 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>
CMF Foundational Tool Testing	MIPR	47 CTS : San Antonio, TX	-	-		-		2.900	Jan 2020	-		2.900	Continuing	Continuing	-
<b>Subtotal</b>			-	-		-		2.900		-		2.900	Continuing	Continuing	N/A
<b>Management Services (\$ in Millions)</b>				<b>FY 2018</b>		<b>FY 2019</b>		<b>FY 2020 Base</b>		<b>FY 2020 OCO</b>		<b>FY 2020 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>
CMF Foundational Tool PSC (A&AS, FFRDC)	C/Various	Various : Various	-	-		-		3.800	Jan 2020	-		3.800	Continuing	Continuing	-
<b>Subtotal</b>			-	-		-		3.800		-		3.800	Continuing	Continuing	N/A
			<b>Prior Years</b>	<b>FY 2018</b>		<b>FY 2019</b>		<b>FY 2020 Base</b>		<b>FY 2020 OCO</b>		<b>FY 2020 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			-	-		0.000		35.000		-		35.000	Continuing	Continuing	N/A
<b>Remarks</b>															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force										Date: February 2019																			
Appropriation/Budget Activity 3600 / 4										R-1 Program Element (Number/Name) PE 0305251F / <i>Cyberspace Operations Forces and Force Support</i>										Project (Number/Name) 646008 / <i>US Cyber Command Technology Development</i>									

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
CMF Foundational Tools																												
CMF Foundational Tool Development																												
Interoperability Development																												
Automated Test Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0305251F / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) 646008 / <i>US Cyber Command Technology Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>CMF Foundational Tools</b>				
CMF Foundational Tool Development	2	2020	4	2024
Interoperability Development	2	2020	4	2021
Automated Test Development	2	2020	4	2021