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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force										Date: February 2018		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0604735F I Combat Training Ranges							
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
Total Program Element	-	57.200	87.350	35.895	0.000	35.895	31.165	8.415	23.795	24.228	Continuing	Continuing
652286: Combat Training Range Equipment	-	57.200	87.350	35.895	0.000	35.895	31.165	8.415	23.795	24.228	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 5, PE 0604735F, project 652286, Live Mission Operations Capability (LMOC), is a new start.

A. Mission Description and Budget Item Justification

The Combat Training Range (CTR) program provides equipment and support to Air Force units and combat training ranges for electronic warfare (EW) mission testing, training, and evaluation of aircrews, as well as operational testing of weapon systems and tactics under simulated combat conditions. This program provides funding for the development and integration of electronic warfare training capabilities to include: Air Combat Training Systems (ACTS); threat emitters; advanced radar threat systems; communication jammers; instrumentation equipment/systems; and command & control and debrief capability. These systems and capabilities support integrated training operations for all aircraft (including 5th Gen) and for joint, coalition, and Live Virtual Constructive training events.

The Advanced Radar Threat System (ARTS) programs develop, design, build and test threat system simulators based on advanced foreign fielded surface-to-air missile (SAM) radar threat systems. ARTS will be used at Department of Defense (DoD) training ranges for 4th and 5th generation aircrew training and tactics development to increase combat effectiveness and aircrew survivability by training aircrews to engage or defend against an advanced SAM threat before encountering it in actual combat to stress their tactics, techniques and procedures. The ARTS-Variant 1 (ARTS-V1) is focused on long-range, re-locatable radar threat systems. ARTS-Variant 2 (ARTS-V2) creates mobile, short/medium-range radar threat systems. ARTS-Variant 3 (ARTS-V3) will establish a long range, high power SAM radar simulator. ARTS-Variant 4 (ARTS-V4) will establish a highly mobile, tactical modern threat simulator. The ARTS program supports early research, studies, technology development, and planning for next generation threat systems that challenge the Air Force's asymmetric advantage. The ARTS programs also fund development of high fidelity surrogate targets matching simulated threat systems, to stress 5th generation sensor fusion capabilities.

Legacy range threat systems include Multiple Threat Emitter System (MUTES), Miniature Multiple Threat Emitter System (Mini-MUTES), Modular Threat Emitter (MTE) system, Tactical Radar Threat Generator (TRTG) system, Band Simulator, Unmanned Modular Threat Emitter (UMTE) system, and legacy Joint Threat Emitter (JTE) systems. The Legacy Range Threat Systems Low Cost Mod (LRTSLCM) effort funds development of modifications for legacy threat systems to provide continued combat training relevancy and enhanced systems capabilities. Enhancements focus on upgrading threat systems to match fielded modifications for foreign threat systems faced by combat aircrews. The Common Electronic Attack Receiver (CEAR) provides reactive training and enhanced debriefs using legacy threats. The Digital Threat Relevancy (DTR) effort upgrades Band Simulator and other legacy emitters with modern electronics to improve threat relevance and sustainability. The Double Digit Threat Emitter (DDTE) effort leverages JTE to provide a lower cost EW simulator, enabling greater on-range threat density of advanced SAM radars.

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P5 Combat Training System program addresses new capability requirements for the fielded P5 system, to include continued operations in a GPS-denied environment. Lastly, this program funds ongoing analyses, studies, risk reduction efforts, and/or technology development to enhance Operational Training Infrastructure (OTI), such as combat training range equipment integration into a blended training (Live, Virtual, Constructive) architecture, communication and GPS jammers, weapon drop scoring systems and infrastructure networks. These enhancements add a critical dimension to exercises and optimize warfighter training.						
In FY19 Live Mission Operations Capability(LMOC) is a new start. In FY18 ARTS-V3 and ARTS-V4 were new starts.						
This program element 0604735F may include necessary civilian pay expenses required to manage, execute, and deliver Combat Training Range 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						
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.						
B. Program Change Summary (\$ in Millions)		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget		77.409	87.350	70.361	0.000	70.361
Current President's Budget		57.200	87.350	35.895	0.000	35.895
Total Adjustments		-20.209	0.000	-34.466	0.000	-34.466
• Congressional General Reductions		0.000	0.000			
• Congressional Directed Reductions		-9.000	0.000			
• Congressional Rescissions		0.000	0.000			
• Congressional Adds		0.000	0.000			
• Congressional Directed Transfers		0.000	0.000			
• Reprogrammings		-9.456	0.000			
• SBIR/STTR Transfer		-1.753	0.000			
• Other Adjustments		0.000	0.000	-34.466	0.000	-34.466
Change Summary Explanation						
FY2017 Congressional reduction of \$9.0M was to "Improve Fund Management: Forward Financing."						
FY2017 Reprogrammings support higher Air Force priorities.						
FY2019 The FY19 funding request was reduced by \$34.466 million to account for the availability of prior year execution balances.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2017	FY 2018	FY 2019
Title: P5 Combat Training System (CTS)				5.000	0.499	0.175

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Description: P5 CTS funding supports Air Combat Training Systems (ACTS) capabilities and includes the development, integration and testing of future software/hardware upgrades, aircraft/pod integration, upgrades for range applications, and associated studies. Additionally, funding supports efforts to enable initial training interoperability with 5th Generation aircraft via Ground Subsystem (GS) decryption of secure (encrypted) Time, Space Position Information (TSPI), weapon simulation, and other training data. FY 2018 Plans: P5 CTS funding is supporting development, integration and testing of future software/hardware upgrades, aircraft/pod integration, and upgrades for range applications. FY 2019 Plans: Funding will be used to initiate GPS denied training operations capability development for the P5 CTS system, including program documentation and generating a request for proposal documents. FY 2018 to FY 2019 Increase/Decrease Statement: The decrease is due to the P5 CTS Block 4/4a upgrades completing in FY18 and efforts to support P5 GPS denied training operations beginning in FY19.				
Title: Legacy Range Threat Systems Description: The Legacy Range Threat Systems Low Cost Mod (LRTSLCM) effort develops, integrates, and tests modifications to extend the systems' service life through threat relevancy and enhanced systems capabilities. Legacy Systems include the Multiple Threat Emitter System (MUTES), the Miniature Multiple Threat Emitter System (Mini-MUTES), the Modular Threat Emitter (MTE) system, the Tactical Radar Threat Generator (TRTG) system, the Band Simulator, and the Unmanned Modular Threat Emitter (UMTE) system. It also covers legacy Joint Threat Emitter systems. The Common Electronic Attack Receiver (CEAR) modification enables radar threat emitters to realistically react to electronic counter measures, expendable counter measures, maneuvers, and terrain masking initiated by aircrew during electronic combat training for simulated penetrations of hostile airspace. CEAR also enables recording of aircrew reactions for playback and debriefing. FY 2018 Plans: Funding is being used to conduct efforts for integration of the current CEAR design onto the Mini-MUTES system. FY 2019 Plans: FY2019 funds will be used to prepare for a Mini-MUTES modification for improved threat relevance. FY 2018 to FY 2019 Increase/Decrease Statement:		0.014	4.128	0.175

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
The decrease in funding is due to decreased current requirements to support CEAR in FY19.				
Title: Advanced Radar Threat System (ARTS-V1) Development Description: The Advanced Radar Threat System-Variant 1 (ARTS-V1) program will develop, design, build and test threat system simulators based on advanced strategic, long-range, re-locatable foreign fielded surface-to-air missile (SAM) radar threat systems. ARTS-V1 will leverage an existing DoD test resource development program to reduce non-recurring development cost, schedule risk, and promote range interoperability between test and training. ARTS-V1 is designed to be used at Department of Defense (DoD) training ranges for aircrew training and tactics development to increase combat effectiveness and aircrew survivability by training aircrews to engage or defend against an advanced SAM threat before encountering it in actual combat. Various aircraft platforms may train against ARTS-V1, but the most stringent requirements for ARTS-V1 come from fifth generation aircraft capabilities. Additionally, development of a high-fidelity surrogate target, ongoing analyses, studies, and risk reduction efforts will focus on integrating ARTS and other systems into regional range and Live Virtual Constructive architectures. FY 2018 Plans: ARTS-V1 funds are supporting development and fabrication of Production Representative Article (PRA) development and creation of technical data package. FY 2019 Plans: ARTS-V1 funding will support completing development of Production Representative Article (PRA) and continue fabrication to include integration and testing. It will also support completion of a of technical data package. FY 2018 to FY 2019 Increase/Decrease Statement: The decrease in funding is due to a shift of integration efforts into late FY19.		13.033	14.050	9.919
Title: Advanced Radar Threat System (ARTS-V2) Development Description: The Advanced Radar Threat System-Variant 2 (ARTS-V2) Program will develop, design, build and test a threat system simulator based on an advanced tactical, mobile, short/medium range foreign fielded surface-to-air missile (SAM) radar threat system. ARTS-V2 is designed to be used at Department of Defense (DoD) training ranges for aircrew training and tactics development to increase combat effectiveness and aircrew survivability by training aircrews to engage or defend against an advanced SAM threat before encountering it in actual combat. Various aircraft platforms may train against ARTS-V2, but the most stringent requirements placed on ARTS-V2 design come from fifth generation aircraft capabilities. Additionally, ongoing analyses, studies, and risk reduction efforts will focus on integrating ARTS-V2 and other systems into Live Virtual Constructive architectures. FY 2018 Plans: ARTS-V2 funds are being used to support the Engineering and Manufacturing Development (EMD) contract for Production Representative Article (PRA) development through programmatic and technical reviews and build of the PRA. Additionally		39.153	57.762	17.285

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C. Accomplishments/Planned Programs (\$ in Millions) funding is supporting ongoing analyses and studies focused on integrating ARTS into regional range and Live Virtual Constructive architectures. FY 2019 Plans: ARTS-V2 funding will be used to support the Engineering and Manufacturing Development (EMD) contract for Production Representative Article (PRA) development through programmatic and technical reviews and build of the PRA. Funding also will support integration and testing. Additionally funding will support ongoing analyses and studies focused on integrating ARTS into regional range and Live Virtual Constructive architectures. FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to the program progressing through EMD and shifting from design and article build to test.		FY 2017	FY 2018	FY 2019
Title: Advanced Radar Threat System (ARTS-V3) Development Description: The Advanced Radar Threat System-Variant 3 (ARTS-V3) Program will develop, design, build and test an advanced surface-to-air threat simulation systems replicating current strategic/tactical threat (s) at the fidelity necessary to stress current EW systems, 5th and 6th generation air platform engagements and be integrated into a future CAF LVC system. ARTS-V3 will provide an A2/AD environment for CAF test and training with a highly reactive threat systems that provides immediate feedback to aircrews. The ART-V3 system will create a relevant combat training threat system that is dynamic and reconfigurable to represent a modern, dynamic adversary force. FY 2018 Plans: ARTS-V3 funds are establishing program foundation to include intelligence & requirements support, early research, studies, support technology maturation, and planning to support a Milestone B decision. Funds are supporting intelligence data to ensure emulation of the real world system is relevant and realistic. FY 2019 Plans: ARTS-V3 funding will establish program foundation to include intelligence & requirements support, early research, studies, and support technology maturation and reduce Milestone B risk. FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to a shift in program schedule.		0.000	4.911	1.000
Title: Advanced Radar Threat System (ARTS-V4) Development Description: The Advanced Radar Threat System-Variant 4 (ARTS-V4) Program will develop, design, build and test a modern surface-to-air threat simulation system(s) replicating current tactical highly mobile threats at the fidelity necessary to stress current EW systems, 5th and 6th generation air platform engagements and be integrated into a future CAF LVC system. ARTS-V4 will leverage an existing DoD training resource/s development program to reduce non-recurring development cost, schedule risk,		0.000	4.000	6.641

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C. Accomplishments/Planned Programs (\$ in Millions) and promote range interoperability between test and training. ARTS-V4 will provide an A2/AD environment for CAF test and training with a highly reactive threat systems that provides immediate feedback to aircrews. The ART-V4 system will create a relevant combat training threat system that is dynamic and reconfigurable to represent a dynamic adversary force. Additionally funding will support ongoing analyses and studies focused on integrating ARTS into regional range and Live Virtual Constructive architectures. FY 2018 Plans: ARTS-V4 funds are establishing program foundation to include intelligence & requirements support, early research, studies, support technology maturation, and planning to support a Milestone B decision. Funding will be used to support intelligence data to ensure emulation of the real world system is relevant and realistic FY 2019 Plans: ARTS-V4 funding will support finalizing program foundation to include intelligence & requirements support, early research, studies, support technology maturation and demonstration, and planning to support a Milestone B decision. Funding will be used to support intelligence data to ensure emulation of the real world system is relevant and realistic. FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to preliminary efforts progressing towards system development.		FY 2017	FY 2018	FY 2019
Title: Digital Threat Relevancy (DTR) Development Description: Digital Threat Relevancy will conduct RDT&E to modernize the Range Threat family of systems, focusing on the Band Sim Emitter. Foreign fielded surface to air (SAM) threat systems have undergone major modernization programs to replace aging analog technology with modern digital electronics. This program requires the development of digital electronics upgrades to provide realistic electronic warfare training to combat aircrews. This effort will improve threat fidelity (ensuring threat faithful RF emissions), increase reliability, maintainability, supportability, system mobility, and support remote operations with Digital Integrated Air Defense Systems (DIADS). This effort supports warfighter development of new tactics, techniques, and procedures in a relevant, realistic combat environment. FY 2018 Plans: Digital Threat Relevancy funding is supporting preparation for Milestone B and solicitation for an Engineering and Manufacturing Development (EMD) contract award to design and build a prototype of a Mobile MPS-T1 threat system, as a first step in upgrading aging threat systems to replicate modernized foreign threat systems. Efforts are focusing on replacing analog technology with digital electronics in both the control and emitter subsystems of the MPS-T1 threat system. Funding is being used to study		0.000	2.000	0.350

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
enhancements to legacy systems capable of providing advanced SAM threats through integration of COTS or previously developed technology into existing systems. FY 2019 Plans: Digital Threat Relevancy funding will support preparation for Milestone B, solicitation, and source selection through Engineering and Manufacturing Development (EMD) contract award to design and build a prototype of a Mobile MPS-T1 threat system, as a first step in upgrading aging threat systems to replicate modernized foreign threat systems. Efforts are focusing on replacing analog technology with digital electronics in both the control and emitter subsystems of the MPS-T1 threat system. Funding is being used to study enhancements to legacy systems capable of providing advanced SAM threats through integration of COTS or previously developed technology into existing systems. FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased due to a change in acquisition strategy and updated program schedule.				
Title: Live Mission Operations Capability (LMOC) Description: The LMOC program will regionalize and standardize training airspace, threat systems, and control centers to challenge 5th generation aircrew and provide comprehensive training support for all warfighters. It will provide a node-based enterprise that integrates range system capabilities in a multi-level secure environment to enable blended live-synthetic training for combat and combat support units including F-22 and F-35. It will address three combat training capability requirements: build and display an integrated surface and air picture; manage training; and Live Virtual Constructive training operations. FY 2018 Plans: N/A. New Start in FY 2019. FY 2019 Plans: LMOC funding will support risk reduction, pre-solicitation for development and fielding efforts, Milestone B preparation, initial stand-up of a hardware-in-the-loop lab, and associated acquisition efforts to include logistics, testing, and cyber security planning. FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased due to being a new start in FY19.		-	0.000	0.350
Accomplishments/Planned Programs Subtotals		57.200	87.350	35.895

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D. Other Program Funding Summary (\$ in Millions)												
			FY 2019	FY 2019	FY 2019						Cost To	
Line Item	FY 2017	FY 2018	Base	OCO	Total	FY 2020	FY 2021	FY 2022	FY 2023	Complete	Total Cost	
• OPAF 03 Line Item 834190: <i>Combat Training Ranges</i>	34.850	115.198	132.675	-	132.675	232.748	193.955	195.367	175.130	Continuing	Continuing	
• OPAF 05 Line Item 861900: <i>Spares and Repair Parts</i>	5.930	15.988	10.107	-	10.107	10.882	6.783	19.100	0.725	Continuing	Continuing	
• APAF 07 Line Item 000075: <i>Other Production Charges</i>	1.662	-	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing	
• APAF 06 Line Item 000999: <i>Initial Spares/Repair Parts</i>	0.000	-	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing	
Remarks												
E. Acquisition Strategy												
The acquisition strategy is competition focused, with both cost plus and fixed price contracts.												
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: PB 2019 Air Force												Date: February 2018			
Appropriation/Budget Activity 3600 / 5						R-1 Program Element (Number/Name) PE 0604735F / Combat Training Ranges				Project (Number/Name) 652286 / Combat Training Range Equipment					
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
Advanced Radar Threat System-Variant 3 (ARTS-V3) Development	MIPR	Various : Various, NV	-	-		0.080	Dec 2017	0.637	May 2019	-		0.637	Continuing	Continuing	-
Advanced Radar Threat System-Variant 1 (ARTS-V1) Development	Various	Various : Hill AFB, UT	-	8.606	Sep 2017	14.015	Mar 2018	7.419	May 2019	-		7.419	Continuing	Continuing	-
Advanced Radar Threat System-Variant 2 (ARTS-V2) Development	C/Various	Not specified. : HILL AFB, UT	-	36.385	Jun 2017	57.563	Jun 2018	13.370	Sep 2019	-		13.370	Continuing	Continuing	-
Advanced Radar Threat System-Variant 4 (ARTS-V4) Development	Various	Various : Hill AFTB, UT	-	-		0.500	May 2018	4.941	Mar 2019	-		4.941	Continuing	Continuing	-
Legacy System Improvements	Various	Not specified. : Hill AFB, UT	-	0.000	May 2017	4.108	May 2018	-		-		-	Continuing	Continuing	-
JSF Encrypted Pass-Through Development (P5CTS)	Various	Various : Various, NV	-	2.200	Mar 2017	-		-		-		-	Continuing	Continuing	-
Subtotal			-	47.191		76.266		26.367		-		26.367	Continuing	Continuing	N/A
Support (\$ 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
Advanced Radar Threat Systems (Direct Msn Support)	Various	Various : Various, NV	-	2.750	Jun 2017	8.446	Jun 2018	1.063	Jan 2019	-		1.063	Continuing	Continuing	-
P5 CTS (Direct Msn Spt)	Various	TBD : TBD, NV	-	0.739	Mar 2017	-		-		-		-	Continuing	Continuing	-
Subtotal			-	3.489		8.446		1.063		-		1.063	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force												Date: February 2018			
Appropriation/Budget Activity 3600 / 5						R-1 Program Element (Number/Name) PE 0604735F / <i>Combat Training Ranges</i>				Project (Number/Name) 652286 / <i>Combat Training Range Equipment</i>					
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
P5CTS Flight Test, 46 Test Wing	Various	Eglin AFB : FL, NV	-	0.132	Mar 2017	-		-		-		-	Continuing	Continuing	-
Advanced Radar Threat Systems (Direct Msn Support)	C/CPAF	Not specified. : TBD	-	-		-		1.400	Dec 2018	-		1.400	Continuing	Continuing	-
Subtotal			-	0.132		-		1.400		-		1.400	Continuing	Continuing	N/A
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
Advanced Radar Threat Systems (PMA/A&AS)	Various	Various : Hill AFB, UT	-	5.059	Jun 2017	2.139	Jun 2018	6.015	Jun 2019	-		6.015	Continuing	Continuing	-
P5 CTS (PMA/A&AS)	Various	AFLCMC/AZS : Hill AFB, UT	-	1.329	Mar 2017	0.499	Mar 2018	0.175	Jun 2019	-		0.175	Continuing	Continuing	-
Live Mission Operations Capability (LMOC) (PMA/A&AS)	Various	AFLCMC/AZS : Hill AFB, UT	-	-		-		0.350	Jun 2019	-		0.350	Continuing	Continuing	-
Digital Threat Relevancy (PMA/A&AS)	Various	AFLCMC/AZS : Hill AFB, UT	-	-		-		0.350	Jun 2019	-		0.350	Continuing	Continuing	-
Legacy Range Threat Systems Low Cost Mod (LRTSLCM) (PMA/A&AS)	Various	AFLCMC/AZS : Hill AFB	-	-		-		0.175	Jun 2019	-		0.175	Continuing	Continuing	-
Subtotal			-	6.388		2.638		7.065		-		7.065	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			-	57.200		87.350		35.895		-		35.895	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 / 5

R-1 Program Element (Number/Name)

PE 0604735F / Combat Training Ranges

Project (Number/Name)

652286 / Combat Training Range Equipment

	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
Combat Training Range Equipment																												
P5CTS Development																												
-- P5 CTS GPS Denied Capability																												
Advanced Radar Threat System-Variant 1(ARTS-V1) EMD Phase																												
-- Develop First Article (PRA)																												
-- Factory Acceptance Test																												
-- Milestone C																												
Advanced Radar Threat System-Variant 2 (ARTS-V2) EMD Phase																												
-- ARTS-V2 Contract																												
-- ARTS-V2 PDR																												
-- ARTS-V2 CDR																												
-- ARTS-V2 DT-E and OT-E																												
-- ARTS-V2 Milestone C																												
Advanced Radar Threat System-Variant 3 (ARTS-V3) EMD Phase																												
--ARTS-V3 Pre-milestone B Activities																												
--ARTS-V3 RFP Prep																												
-- ARTS-V3 Milestone B																												
-- ARTS-V3 EMD contract																												
-- ARTS-V3 PDR																												
Advanced Radar Threat System-Variant 4 (ARTS-V4) Pre-milestone B																												
-- ARTS-V4 Milestone B																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force																						Date: February 2018															
Appropriation/Budget Activity 3600 / 5										R-1 Program Element (Number/Name) PE 0604735F / Combat Training Ranges								Project (Number/Name) 652286 / Combat Training Range Equipment																			
										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				
-- ARTS-V4 Development																																					
Digital Threat Relevancy (DTR), Emitter Development																																					
Legacy Range Threat Systems LCM, Mini-MUTES mod																																					
Live Mission Operations Capability (LMOC)																																					

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604735F / <i>Combat Training Ranges</i>	Project (Number/Name) 652286 / <i>Combat Training Range Equipment</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Combat Training Range Equipment</i>				
P5CTS Development	2	2017	4	2020
-- P5 CTS GPS Denied Capability	2	2019	2	2021
Advanced Radar Threat System-Variant 1(ARTS-V1) EMD Phase	1	2017	4	2022
-- Develop First Article (PRA)	1	2017	4	2021
-- Factory Acceptance Test	4	2020	4	2020
-- Milestone C	4	2021	4	2021
Advanced Radar Threat System-Variant 2 (ARTS-V2) EMD Phase	1	2017	4	2022
-- ARTS-V2 Contract	3	2017	1	2021
-- ARTS-V2 PDR	3	2018	3	2018
-- ARTS-V2 CDR	1	2019	2	2019
-- ARTS-V2 DT-E and OT-E	2	2019	4	2020
-- ARTS-V2 Milestone C	1	2021	1	2021
Advanced Radar Threat System-Variant 3 (ARTS-V3) EMD Phase	1	2018	4	2023
--ARTS-V3 Pre-milestone B Activities	1	2018	4	2021
--ARTS-V3 RFP Prep	1	2018	4	2020
-- ARTS-V3 Milestone B	4	2021	4	2023
-- ARTS-V3 EMD contract	4	2021	4	2023
-- ARTS-V3 PDR	4	2021	4	2022
Advanced Radar Threat System-Variant 4 (ARTS-V4) Pre-milestone B	1	2018	3	2020
-- ARTS-V4 Milestone B	1	2021	1	2021
-- ARTS-V4 Development	2	2021	4	2023

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Appropriation/Budget Activity 3600 / 5		R-1 Program Element (Number/Name) PE 0604735F / Combat Training Ranges		Project (Number/Name) 652286 / Combat Training Range Equipment	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Digital Threat Relevancy (DTR), Emitter Development		2	2019	4	2022
Legacy Range Threat Systems LCM, Mini-MUTES mod		2	2019	2	2023
Live Mission Operations Capability (LMOC)		2	2019	4	2023