Department of Defense
Fiscal Year (FY) 2023 Budget Estimates

April 2022

Operational Test and Evaluation, Defense

Defense-Wide Justification Book Volume 5 of 5

Operational Test and Evaluation, Defense

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Table of Volumes

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Department of Defense
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 Apr 2022

Appropriation	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****
Operational Test & Eval, Defense	257,120	276,591				
Total Research, Development, Test & Evaluation	257,120	276,591				

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 5, 2022 at 15:15:56
*Includes enacted funding pursuant to the Extending Government Funding and Delivering Emergency Assistance Act (Public Law 117-43).
**Includes enacted funding pursuant to the Further Extending Government Funding Act (Public Law 117-70).
***Includes enacted funding pursuant to the Further Additional Extending Government Funding Act (Public Law 117-86).
****Includes enacted funding pursuant to the Ukraine Supplemental Appropriations Act (Public Law 117-103).

Department of Defense
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 Apr 2022

Appropriation	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request
Operational Test & Eval, Defense		276,591	277,194
Total Research, Development, Test & Evaluation		276,591	277,194

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 5, 2022 at 15:15:56

Department of Defense
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 Apr 2022

Summary Recap of Budget Activities	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****
Management Support	257,120	276,591				
Total Research, Development, Test & Evaluation	257,120	276,591				
Summary Recap of FYDP Programs						
Research and Development	257,120	276,591				
Total Research, Development, Test & Evaluation	257,120	276,591				

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Department of Defense
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
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05 Apr 2022

Summary Recap of Budget Activities	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request
Management Support		276,591	277,194
Total Research, Development, Test & Evaluation		276,591	277,194

Summary Recap of FYDP Programs			
Research and Development		276,591	277,194
Total Research, Development, Test & Evaluation		276,591	277,194

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Defense-Wide
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 Apr 2022

Summary Recap of Budget Activities	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****
Management Support	257,120	276,591				
Total Research, Development, Test & Evaluation	257,120	276,591				
Summary Recap of FYDP Programs						
Research and Development	257,120	276,591				
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Defense-Wide
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 Apr 2022

Summary Recap of Budget Activities	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request
Management Support		276,591	277,194
Total Research, Development, Test & Evaluation		276,591	277,194

Summary Recap of FYDP Programs			
Research and Development		276,591	277,194
Total Research, Development, Test & Evaluation		276,591	277,194

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 5, 2022 at 15:15:56

Defense-Wide
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 Apr 2022

Appropriation: 0460D Operational Test & Eval, Defense

Line No	Program Element Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	Sec
1	0605118OTE	Operational Test and Evaluation	06	113,133	105,394					U
2	0605131OTE	Live Fire Test and Evaluation	06	74,048	103,549					U
3	0605814OTE	Operational Test Activities and Analyses	06	69,939	67,648					U
		Management Support		257,120	276,591					
Total Operational Test & Eval, Defense				257,120	276,591					

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 5, 2022 at 15:15:56
*Includes enacted funding pursuant to the Extending Government Funding and Delivering Emergency Assistance Act (Public Law 117-43).
**Includes enacted funding pursuant to the Further Extending Government Funding Act (Public Law 117-70).
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Defense-Wide
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 Apr 2022

Appropriation: 0460D Operational Test & Eval, Defense

Line No	Program Element Number	Item	Act	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request	Sec
1	0605118OTE	Operational Test and Evaluation	06		105,394	119,529	U
2	0605131OTE	Live Fire Test and Evaluation	06		103,549	99,947	U
3	0605814OTE	Operational Test Activities and Analyses	06		67,648	57,718	U
		Management Support			276,591	277,194	
		Total Operational Test & Eval, Defense			276,591	277,194	

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 5, 2022 at 15:15:56

Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 0460: Operational Test and Evaluation, Defense

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Program Element Table of Contents (Alphabetically by Program Element Title)

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Operational Test and Evaluation, Defense	Date: April 2022
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605118OTE / *Operational Test and Evaluation (OT&E)*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	93.291	113.133	105.394	119.529	-	119.529	123.601	127.056	129.036	130.743	Continuing	Continuing
000310: *OT&E*	93.291	113.133	105.394	119.529	-	119.529	123.601	127.056	129.036	130.743	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Director, Operational Test and Evaluation (DOT&E) was created by Congress in 1983. The Director is prescribed, by authority of the Secretary of Defense, policies and procedures for the conduct of operational test and evaluation (OT&E) in the Department of Defense (DOD). The Director provides guidance to and consult with the Secretary of Defense, the Under Secretary of Defense for Acquisition and Sustainment, and the Under Secretary of Defense for Research and Engineering and the Secretaries of the military departments with respect to OT&E in the DOD in general and to specific OT&E to be conducted in the department. Generally, there are about 235 programs on the oversight list including all Major Defense Acquisition Programs (MDAP) and programs across each of the six adaptive acquisition pathways. Programs identified as MDAPs for the purposes of test and evaluation may not proceed beyond low-rate initial production (BLRIP) until OT&E of the program is complete. DOT&E is involved early in the planning phase of each program to ensure adequate testing is planned and executed. Key elements of DOT&E's oversight authority include:

- Approval of component Test and Evaluation Master Plans (TEMPS).
- Approval of component OT&E Test Plans (TPs).
- Oversight of military department preparation and conduct of field operational tests; analysis and evaluation of the resultant test data; the assessment of the adequacy of the executed test and evaluation; and assessment of the operational effectiveness, lethality, and suitability of the weapon systems.
- Reporting results of OT&E that support BLRIP decisions to the Secretary of Defense and Congress, and providing an annual report summarizing all OT&E activities and the adequacy of test resources within DOD during the previous fiscal year.
- Review of DOD budgets and financial matters related to OT&E, and recommendations to the Secretary of Defense on all matters relating to operational test facilities and equipment.

DOT&E also oversees and resources OT&E community efforts to plan and execute joint cybersecurity assessments of fielded systems and networks during major Combatant Command (CCMD) and Service exercises, and reports the trends and findings in the annual report. DOT&E is also involved in assessing and increasing the capacity of realistically advanced cyber warfighting capabilities to keep pace with heightened demand, advancing technologies and the growing cyber threat.

This Program Element includes funds to obtain Federally Funded Research and Development Center (FFRDC) support in performing the described tasks, travel funds to carry out oversight of the OT&E and cyber assessment programs, funds for Service teams performing information assurance and interoperability assessments during exercises, administrative support services, DFAS support, and engineering and technical support services.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Operational Test and Evaluation, Defense	Date: April 2022
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605118OTE / *Operational Test and Evaluation (OT&E)*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	113.133	105.394	0.000	-	0.000
Current President's Budget	113.133	105.394	119.529	-	119.529
Total Adjustments	0.000	0.000	119.529	-	119.529
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustment to Budget Year	-	-	119.529	-	119.529

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding. Increased funding that begins in FY 2023 will expand cybersecurity assessments of artificial intelligence (AI) enabled technologies deployed to CCMDs under the Department's Advanced Data Analytics initiative, increase coverage for Persistent Cyber Operations (PCO) activities, and increase cyber threat realism.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense			Date: April 2022
Appropriation/Budget Activity 0460 / 6	R-1 Program Element (Number/Name) PE 0605118OTE / *Operational Test and Evaluation (OT&E)*	Project (Number/Name) 000310 / *OT&E*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
000310: *OT&E*	93.291	113.133	105.394	119.529	-	119.529	123.601	127.056	129.036	130.743	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Director, Operational Test and Evaluation (DOT&E) was created by Congress in 1983. The Director is prescribed, by authority of the Secretary of Defense, policies and procedures for the conduct of operational test and evaluation (OT&E) in the Department of Defense (DOD). The Director provides guidance to and consult with the Secretary of Defense, the Under Secretary of Defense for Acquisition and Sustainment, and the Under Secretary of Defense for Research and Engineering and the Secretaries of the military departments with respect to OT&E in the DOD in general and to specific OT&E to be conducted in the department. Generally, there are about 235 programs on the oversight list including all Major Defense Acquisition Programs (MDAP) and programs across each of the six adaptive acquisition pathways. Programs identified as MDAPs for the purposes of test and evaluation may not proceed beyond low-rate initial production (BLRIP) until OT&E of the program is complete. DOT&E is involved early in the planning phase of each program to ensure adequate testing is planned and executed. Key elements of DOT&E's oversight authority include:

- Approval of component Test and Evaluation Master Plans (TEMPS).
- Approval of component OT&E Test Plans (TPs).
- Oversight of military department preparation and conduct of field operational tests; analysis and evaluation of the resultant test data; the assessment of the adequacy of the executed test and evaluation; and assessment of the operational effectiveness, lethality, and suitability of the weapon systems.
- Reporting results of OT&E that support BLRIP decisions to the Secretary of Defense and Congress, and providing an annual report summarizing all OT&E activities and the adequacy of test resources within DOD during the previous fiscal year.
- Review of DOD budgets and financial matters related to OT&E, and recommendations to the Secretary of Defense on all matters relating to operational test facilities and equipment.

DOT&E also oversees and resources OT&E community efforts to plan and execute joint cybersecurity assessments of fielded systems and networks during major Combatant Command (CCMD) and Service exercises, and reports the trends and findings in the annual report. DOT&E is also involved in assessing and increasing the capacity of realistically advanced cyber warfighting capabilities to keep pace with heightened demand, advancing technologies and the growing cyber threat.

This Program Element includes funds to obtain Federally Funded Research and Development Center (FFRDC) support in performing the described tasks, travel funds to carry out oversight of the OT&E and cyber assessment programs, funds for Service teams performing information assurance and interoperability assessments during exercises, administrative support services, DFAS support, and engineering and technical support services.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Operational Test and Evaluation	113.133	105.394	119.529
Description: Operational Test and Evaluation (OT&E) Oversight			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605118OTE / *Operational Test and Evaluation (OT&E)*	**Project (Number/Name)** 000310 / *OT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
This effort is in direct support of the Director's Title 10 responsibilities and is a continuing effort. Funding for Fiscal Year 2023 provides OT&E inputs for TEMPs, TPs, System Acquisition Reports, and Defense Acquisition Executive Summary Reports for those programs designated for oversight by DOT&E. The Key elements are identified in the DOD Instructions signed by the DOT&E and the Under Secretary of Defense (Research & Evaluation). This also includes funding for congressionally mandated Test & Evaluation (T&E) oversight of all middle tier of acquisition programs and programs utilizing other Accelerated Acquisition authorities. This includes the development of independent T&E concepts for such programs, review of programs' T&E strategies; observation of relevant test events to ensure compliance with TPs; independent data analysis and development of reports to Secretary of Defense and Congress on all matters related to test adequacy and demonstrated operational effectiveness, suitability, survivability and lethality. ***FY 2022 Plans:*** Cyber Evaluations DOT&E plans to sponsor approximately 50 CCMD and Service cybersecurity assessments and Cyber Readiness Campaign (CRC) events in FY 2022. Each assessment will continue to include "Find-Fix-Verify" efforts to facilitate the remediation of identified vulnerabilities and verify that solutions and mitigations improve warfighter mission assurance. DOT&E plans to continue working with the CCMDs and Services to develop multiyear plans for exercise cyber assessments and CRC events. These plans will focus on assessing the CCMD's or Service's ability to complete missions and be resilient in a cyber-contested environment. DOT&E will perform year-round and long duration assessments of multiple CCMDs and Services with global Persistent Cyber Operations (PCO) authorities, and with US Cyber Command, will work to expand the number of participating CCMDs. Objectives for DOT&E assessments in FY 2022 will include the portrayal of advanced nation-state cyber threats and the assessment of operational missions during realistic cyber attacks, with supporting offensive fires and cyber-range events included in the evaluation. DOT&E will assess Cyber Protection Teams and Cyber Mission Teams when they participate during PCO, CRC, or exercise events. DOT&E will continue assessments of offensive cyber capabilities. DOT&E will also collaborate with the new teams at the CCMDs in conjunction with the Department's initiative to expedite the integration of AI-enabled technology. As appropriate, DOT&E will incorporate cybersecurity assessments of these emerging technologies during other planned CCMD assessments. DOT&E will transmit critical findings to DOD leadership and Congress along with recommended actions to improve DOD's cybersecurity posture. ***FY 2023 Plans:*** Cyber Evaluations DOT&E plans to sponsor approximately 50 CCMD and Service cybersecurity assessments and Cyber Readiness Campaign (CRC) events in FY 2023. Each assessment will continue to include "Find-Fix-Verify" efforts to facilitate the remediation of identified vulnerabilities and verify that solutions and mitigations improve warfighter mission assurance. DOT&E plans to continue working with the CCMDs and Services to develop multiyear plans for exercise cyber assessments and CRC events.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605118OTE / *Operational Test and Evaluation (OT&E)*	**Project (Number/Name)** 000310 / *OT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
These plans will focus on assessing the CCMD's or Service's ability to complete missions and be resilient in a cyber-contested environment. DOT&E will perform year-round and long duration assessments of all CCMDs and Services with Global PCO authorities. Objectives for DOT&E assessments in FY 2023 will include the portrayal of advanced nation-state cyber threats and the assessment of operational missions during realistic cyber attacks, with supporting offensive fires and cyber-range events included in the evaluation. Expanded table-top exercises and war games to stress senior-leader decisions with advanced threats not suitable for exercises will also be performed. DOT&E will assess Cyber Protection Teams and Cyber Mission Teams when they participate during PCO, CRC, or exercise events. DOT&E will continue assessments of offensive cyber capabilities. DOT&E will incorporate cybersecurity assessments of emerging AI-enabled technologies during other planned CCMD assessments. DOT&E will transmit critical findings to DoD leadership and Congress along with recommended actions to improve DoD's cybersecurity posture. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased funding that begins in FY 2023 will expand cybersecurity assessments of AI-enabled technologies deployed to CCMDs under the Department's Advanced Data Analytics initiative, increase coverage for PCO activities, and increase cyber threat realism.			
Accomplishments/Planned Programs Subtotals	113.133	105.394	119.529

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Operational Test and Evaluation, Defense	Date: April 2022
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense I* BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605131OTE *I Live Fire Test and Evaluation (LFT&E)*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	69.172	74.048	103.549	99.947	-	99.947	101.661	105.669	103.747	101.949	Continuing	Continuing
000311: *LFT&E*	69.172	74.048	103.549	99.947	-	99.947	101.661	105.669	103.747	101.949	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element consists of three programs: Joint Live Fire (JLF), Joint Aircraft Survivability Program (JASP), and Joint Technical Coordinating Group for Munitions Effectiveness (JTCG/ME).

This Program Element directly supports the Congressional statutory requirements for oversight of LFT&E. The primary objective of LFT&E is to assure that the vulnerability and survivability of Department of Defense (DOD) crew-carrying platforms and the lethality of our conventional munitions are known and acceptable before entering full-rate production. LFT&E encompasses realistic tests involving actual U.S. and foreign threat hardware or, if not available, acceptable surrogate threat hardware. The objective is to identify and correct design deficiencies early in the development process. A completed LFT&E program and test report is required before programs proceed beyond low-rate initial production (BLRIP). LFT&E also includes realistic modeling and simulation (M&S) to examine survivability and lethality attributes not assessed during testing.

This Program Element supports DoD's Joint Live Fire (JLF) Program. JLF was initiated in 1984 under an Office of the Secretary of Defense charter to test fielded front-line combat aircraft and armor systems for their vulnerabilities as well as fielded weapons, both U.S. and foreign, for their lethality against their respective targets. Funds are also used to support other initiatives related to quick reaction requests from theater and other areas of personnel survivability.

JASP is the DOD's focal point for joint service enhancement of military aircraft non-nuclear survivability. The JASP is chartered by the Commander of the U.S. Navy Naval Air Systems Command, the U.S. Assistant Secretary of the Army (Acquisition Logistics and Technology), and the Commander of the U.S. Air Force Life Cycle Management Center to increase the affordability, readiness, and effectiveness of Tri-Service aircraft through joint coordination and development of survivability technologies, design tools and assessment methodologies. The JASP coordinates and conducts RDT&E to improve military aircraft survivability, develop and standardize aircraft survivability modeling and simulation (M&S), facilitate information exchange on aircraft survivability, and support aircraft survivability education for the DOD and U.S. aircraft community. Each chartering command provides a senior aircraft survivability expert for the JASP Principal Members Steering Group, which guides the program and approves projects for funding. The JASP assesses and reports on combat damage incidents through the Joint Combat Assessment Team (JCAT).

JTCG/ME was chartered over 50 years ago to serve as DOD's focal point for munitions effectiveness information. The JTCG/ME produces Joint Munitions Effectiveness Manuals (JMEMs) that are the sole source for all Joint Service authenticated non-nuclear weapons effectiveness data and methodology for DOD. The JMEMs are the "how to" manuals for putting ordnance on target and as such, directly impacts combat readiness, effectiveness, and survivability. JMEMs are used by the Warfighters in operational weaponeering and collateral damage estimation (CDE) calls in direct support of operations, mission planning, and training; by the DoD, Joint, and Service planners in force-on-force M&S, mission area analysis, requirements studies, and weapon procurement planning; and by the service acquisition community

in performance assessment, analysis of alternatives, and survivability enhancement studies. The JTCG/ME continually evolves weapons effectiveness and target vulnerability data, standards, methodologies, and processes based on the strategic environment for better munitions effectiveness evaluation and support to a more lethal force. JTCG/ME also increases efficiency by leveraging ongoing DOD efforts and supporting the DOD's intent to complement U.S. interest and capabilities by providing weaponeering and targeting capability to coalition partners.

The JMEM requirements and development processes are driven by operational lessons learned (i.e. Inherent Resolve, Resolute Support, and Freedom Sentinel), Joint Staff data call and the needs of Combatant Commands (CCMDs), Services, Military Targeting Committee (MTC) guided by Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 5140.01, Munitions Requirements Process (MRP) - DOD Instruction (DODI) 3000.04 and Operational Users Working Groups (OUWGs) input for specific weapon-target pairings and methodologies. Considerable effort goes into these user forums to establish Warfighter requirements for current and future JTCG/ME products, as well as continued training events and day-to-day support - all with the goal of enabling greater force lethality, strengthened partner capabilities, and optimal use of resources.

This program element also includes funds to obtain Federally Funded Research and Development Center (FFRDC) expertise in performing analyses in support of described LFT&E tasks, as well as travel funds to carry out the LFT&E, JASP, and JTCG/ME programs.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	74.048	68.549	0.000	-	0.000
Current President's Budget	74.048	103.549	99.947	-	99.947
Total Adjustments	0.000	35.000	99.947	-	99.947
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	35.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-	-	99.947	-	99.947

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 000311: *LFT&E*		
Congressional Add: *Program Increase: Lab and Test Range Upgrades*	-	35.000
Congressional Add Subtotals for Project: 000311	-	35.000
Congressional Add Totals for all Projects	-	35.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Operational Test and Evaluation, Defense	Date: April 2022
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense I* BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605131OTE *I Live Fire Test and Evaluation (LFT&E)*

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

FY 2023 Weaponeering Tools to Support Strikes in a Contested Maritime Environment Increase:

The Weaponeering Tools to Support Strikes in a Contested Maritime Environment initiative will enable the ability to bring Joint Fires to bear in a maritime action by providing a joint-service approved, scene-based Maritime Operational Weaponeering Tool that can assess weapons effects and optimize weapon allocation. Funding will used to achieve the following: (1) Development of appropriate weaponeering prediction models (JMEMs for maritime threats), (2) Delivery of critical data to improve lethal effect estimate methodologies, (3) Development of target geometry models for prioritized surface and subsurface maritime targets, (4) Development of weaponeering-level, engineering-level, collateral damage estimation, and predictive battle damage assessment methodologies required by Strike Approval Authorities to make their strike decision calls, and (5) Improvement of supporting engineering models to analyze weapon effectiveness, weapon characteristics, delivery accuracy, reliability, and target vulnerabilities.

This initiative will increase force-wide lethality by providing Combatant Commanders with improved capability to plan and execute missions in a contested maritime environment. It will deliver a weaponeering tool capable of timely and accurate estimates with current and future kinetic/non-kinetic weapons and the required aimpoints to achieve the desired lethal effect against maritime targets (surface and subsurface). More specifically, this enhancement will enable the development of data and analytics based operational tools significantly improving the ability to prosecute high value maritime targets in the INDOPACOM, CENTCOM and EUCOM AORs, while producing salvo tables that will reduce over-allocation of ordnance in an already low-density, high-demand environment.

FY 2023 Joint Targeting Intelligence (JTI) Increase:

JTCG/ME funding will support investment in Joint Targeting Intelligence (JTI) modernization. JTI is the Joint Staff J2's portion of the Joint Targeting Cycle that selects, analyzes, and prioritizes targets and then assesses the results of the application of military force. JTI drives the operations process of linking desired effects to tasks in order to meet the Commander's objectives. This initiative will align the doctrine/ modernize the architecture that governs targeting with the tools that are used for weaponeering, collateral damage estimation, combat assessment, and munitions effectiveness assessment across the CCMDs and Services.

JTI Requirements Definition Package includes 25 requirements for the targeting enterprise to be addressed by selected targeting tools (i.e. Digital Imagery Exploitation Engine (DIEE)/JMEM Weaponeering System (JWS), Joint Targeting Toolbox (JTT), Modernized Integrated Database (MIDB), and Integrated Munitions Effects Assessment (IMEA)).

JTCG/ME, in coordination with Joint Staff J2 and OUSD (I&S), will evolve DIEE/JWS and the DOD's battle damage assessment repository to meet the emerging requirements of the JTI (e.g., Common Data Models in data centric environment), with the goal of providing capabilities to the targeting enterprise that evolve with current technological demands.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense			Date: April 2022
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COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
000311: *LFT&E*	69.172	74.048	103.549	99.947	-	99.947	101.661	105.669	103.747	101.949	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element consists of three programs: Joint Live Fire (JLF), Joint Aircraft Survivability Program (JASP), and Joint Technical Coordinating Group for Munitions Effectiveness (JTCG/ME).

This Program Element directly supports the Congressional statutory requirements for oversight of LFT&E. The primary objective of LFT&E is to assure that the vulnerability and survivability of Department of Defense (DOD) crew-carrying platforms and the lethality of our conventional munitions are known and acceptable before entering full-rate production. LFT&E encompasses realistic tests involving actual U.S. and foreign threat hardware or, if not available, acceptable surrogate threat hardware. The objective is to identify and correct design deficiencies early in the development process. A completed LFT&E program and test report is required before programs proceed beyond low-rate initial production (BLRIP). LFT&E also includes realistic modeling and simulation (M&S) to examine survivability and lethality attributes not assessed during testing.

This Program Element supports DoD's Joint Live Fire (JLF) Program. JLF was initiated in 1984 under an Office of the Secretary of Defense charter to test fielded front-line combat aircraft and armor systems for their vulnerabilities as well as fielded weapons, both U.S. and foreign, for their lethality against their respective targets. Funds are also used to support other initiatives related to quick reaction requests from theater and other areas of personnel survivability.

JASP is the DOD's focal point for joint service enhancement of military aircraft non-nuclear survivability. The JASP is chartered by the Commander of the U.S. Navy Naval Air Systems Command, the U.S. Assistant Secretary of the Army (Acquisition Logistics and Technology), and the Commander of the U.S. Air Force Life Cycle Management Center to increase the affordability, readiness, and effectiveness of Tri-Service aircraft through joint coordination and development of survivability technologies, design tools and assessment methodologies. The JASP coordinates and conducts RDT&E to improve military aircraft survivability, develop and standardize aircraft survivability modeling and simulation (M&S), facilitate information exchange on aircraft survivability, and support aircraft survivability education for the DOD and U.S. aircraft community. Each chartering command provides a senior aircraft survivability expert for the JASP Principal Members Steering Group, which guides the program and approves projects for funding. The JASP assesses and reports on combat damage incidents through the Joint Combat Assessment Team (JCAT).

JTCG/ME was chartered over 50 years ago to serve as DOD's focal point for munitions effectiveness information. The JTCG/ME produces Joint Munitions Effectiveness Manuals (JMEMs) that are the sole source for all Joint Service authenticated non-nuclear weapons effectiveness data and methodology for DOD. The JMEMs are the "how to" manuals for putting ordnance on target and as such, directly impacts combat readiness, effectiveness, and survivability. JMEMs are used by the Warfighters in operational weaponeering and collateral damage estimation (CDE) calls in direct support of operations, mission planning, and training; by the DoD, Joint, and Service planners in force-on-force M&S, mission area analysis, requirements studies, and weapon procurement planning; and by the service acquisition community

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in performance assessment, analysis of alternatives, and survivability enhancement studies. The JTCG/ME continually evolves weapons effectiveness and target vulnerability data, standards, methodologies, and processes based on the strategic environment for better munitions effectiveness evaluation and support to a more lethal force. JTCG/ME also increases efficiency by leveraging ongoing DOD efforts and supporting the DOD's intent to complement U.S. interest and capabilities by providing weaponeering and targeting capability to coalition partners.

The JMEM requirements and development processes are driven by operational lessons learned (i.e. Inherent Resolve, Resolute Support, and Freedom Sentinel), Joint Staff data call and the needs of Combatant Commands (CCMDs), Services, Military Targeting Committee (MTC) guided by Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 5140.01, Munitions Requirements Process (MRP) - DOD Instruction (DODI) 3000.04 and Operational Users Working Groups (OUWGs) input for specific weapon-target pairings and methodologies. Considerable effort goes into these user forums to establish Warfighter requirements for current and future JTCG/ME products, as well as continued training events and day-to-day support - all with the goal of enabling greater force lethality, strengthened partner capabilities, and optimal use of resources.

This program element also includes funds to obtain Federally Funded Research and Development Center (FFRDC) expertise in performing analyses in support of described LFT&E tasks, as well as travel funds to carry out the LFT&E, JASP, and JTCG/ME programs.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Live Fire Test and Evaluation	74.048	68.549	99.947
Description: LFT&E of Major DOD Acquisition Programs The FY 2022 budget will enable DOT&E to assess the adequacy of LFT&E strategies/plans and generate new LFT&E policies to support systems' acquisitions and rapid fielding. The FY 2022 budget will ensure adequate execution of the agreed upon LFT&E plans and subsequent ability to conduct independent analysis of survivability and lethality test and M&S data in support of OSD LFT&E reports to Congress.			
FY 2022 Plans: JLF The FY 2022 JLF budget will support multiple projects as a culmination of continuing 11 projects from previous FYs and 5 new projects. Project objectives will align with DOT&E's Science & Technology Strategic Plan, National Defense Strategy objectives and SECDEF priorities. The FY 2022 program will represent technical areas of warhead lethality, hypersonics, cyber threat discovery, active protection system methodology, mission-based T&E analysis, data analytics, maritime modeling & simulation (M&S) enhancements, and M&S Enhancements for Improved T&E. Warhead Lethality In FY 2022, JLF will continue to increase the accuracy and capability of critical modeling and simulation tools to support test and evaluation efficiency and ensure credibility of DOD assessments and weaponeering tools.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- For example, one effort will continue to update the weaponeering methods needed to estimate effects used in low-collateral-damage munitions such as BLU-129/B to combine very low collateral damage with increased nearfield lethality on a target. - Another effort continues to align the DOD, Department of Energy, and industry experts to improve pedigree of weapons data, provide uncertainty quantification for M&S validation, demonstrate operational and warfighter support for credible weapon effects, and enhance LFT&E by accelerating weapon development timelines and reducing cost. - JLF will continue to address T&E shortfalls needed to adequately evaluate emerging hypersonic weapons by enabling optical characterization of fragment dispersion in flight tests. Cyber Threat Discovery - JLF will continue to develop and optimize machine learning and M&S tools to improve the ability to identify, quantify, and project DOD system vulnerabilities to cyber effects. Active Protection System Methodology - JLF will continue to enhance an M&S capability that will enable efficient evaluation of active protection systems integrated with ground combat vehicles. Mission-based T&E Analysis - JLF will continue to demonstrate applicability of capability-based analysis with System-Theoretic Process Analysis (STPA) techniques, to optimization of LFT&E. Data Analytics In coordination with established service activities, JLF will continue to refine courses of action for consolidating available and future LFT&E data in support of a range of data mining and data analytics intended to more effectively inform requirements, performance evaluations, and development of evaluation/test tools. Maritime M&S Enhancements - JLF will continue to consolidate ongoing efforts to expedite the development and fielding of credible tools needed to evaluate ship vulnerabilities to kinetic threat engagements while also enabling operational users to accurately and timely plan strike missions against adversary surface ships. - JLF will continue the development and plans for execution of a Maritime Survivability and Lethality Test Program (MSLTP) Multi-year Program Plan that will pursue a cohesive, enterprise-wide strategy that seeks to improve efficiency, collaboration, knowledge			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
sharing, and analytical techniques across maritime organizations. The program will identify knowledge gaps, plan collaborative test programs that procure data to fill those gaps, share data among stakeholders, and improve current analytical tools and methods to make assessments going forward. This effort is directly linked to JTCG/ME's "Weaponeering Tools to Support Strikes in a Contested Maritime Environment". M&S Enhancements for Improved T&E JLF efforts will also continue to leverage new technologies and test methods to improve space launch vehicle evaluation efficiency and credibility. - For example JLF will continue to evaluate cost effective data from small-scale testing for blast model validation (JWS and other DoD lethality models) and uncertainty quantification that provides higher confidence levels for weaponeering and mission-planning. JLF will continue to focus on the application of scientific methods to standardize efficient validation, verification, and accreditation processes for LFT&E/Joint Munition Effectiveness Manuals (JMEM) M&S tools to accurately outline M&S capabilities, limitations, uncertainty quantification, and statistical confidence in predicted outcomes. JLF will also continue to lead innovation in LFT&E methods to increase efficiency and support rapid fielding. JASP In FY 2022 the JASP will continue work on 30 multi-year RDT&E projects approved by the JASP PMSG and OSD/DOT&E. The JASP will support the National Defense Strategy objective to 'Build a More Lethal Force' by developing measures to improve threat situational awareness, defeat near-peer adversary radio frequency and infrared guided threats, and provide quantifiable improvements in digital and hardware-in-the-loop M&S capability and credibility. JASP analysis will improve aircraft force protection by advancing system hardening against kinetic and non-kinetic threats. The JCAT will continue to support the Air Force, Army, Marine Corps and Navy by assessing combat damage incidents, training operators on threat effects and combat damage assessment, and reporting their findings to CCMDs and the DOD science and technology and acquisition communities. The JASP will continue supporting aircraft survivability education and information exchange through internet sites (restricted access and classified), by publishing the Aircraft Survivability Journal, developing educational materials and conducting training for the DoD and their contractors. The JASP will initiate, continue and complete other projects as approved by the JASP PMSG and OSD/DOT&E. JTCG/ME			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Deliver JMEM Weaponeering System (JWS) v2.4.1 to the field. Key updates include: PC Effects, Linear Target Model, Tasked Target Text Data (T3D) v8.0.5 and weapons data. Continue to develop JWS v3.0 Technical Previews 8, 9, and 10 which use the Model-View-ViewModel (MVVM) software architecture in scene-based environment. The new JWS v3.0 design will allow a Digital Imagery Exploitation Engine (DIEE) Application Programming Interface (API) to call directly into the calculations engine to support Advanced Target Development (ATD)/Weaponeering functions at CCMD level. Key updates include: JWS Agile Development Support, EndGame Framework (EF) Maintenance & Support, Weapon data, Delivery Accuracy data, User Interface (UI)/User Experience (UX), Structural Target Response (i.e. SBEDS and WinBlast), Materiel Target Response, Personnel Target Response, Trajectory updates and Maritime Target Response. - Deliver Joint Effects Library (JEL) capabilities to develop and complete JWS/DIEE v3.0 weaponeering capabilities. JEL capabilities include new and updated trajectory modeling, new weapons and targets database designs and user interfaces, enhanced structural target response and prediction, personnel and ground mobile vulnerability methods, and JEL model Smart Book. FY 2022 efforts will include continued development of capabilities, which include collateral effects radii tables, enhanced collateral damage mitigation, new ground mobile target capability and data, and new infrastructure targets (tunnels and bridges). - Support requirements collection by hosting JMEM training sessions, Operational Users Working Groups (OUWG), and user help desk via the Joint Product Information Access System (JPIAS). JTCG/ME will support approximately 30 training sessions anticipating about 300 students annually. These training sessions allow users to optimize use of JMEM capabilities, while providing JTCG/ME with critical input for future development. In addition, direct forward support to Combatant Commanders/ Task Forces will be provided to enable target materiel development, weaponeering, and CDE solution development. JTCG/ME will collect user requirements and product use cases, to process and codify in capability needs statements used for planning and JMEM product development. Additionally, in FY 2022, JTCG/ME will deliver the new requirement management tool that will: track requirements' from development and through life-cycle completion; provide context to leadership, analysts, and developers without breaking flow; and align requirements activities with current DevSecOps guidance. - Facilitate coalition interoperability and information exchange forums. JTCG/ME will continue to support/deliver JWS version releases (ROK JWS, JWS v2.4.1 for ACGU) and standalone Probability of Kill Lookup tools to multiple key coalition partners in support of current operations under Foreign Military Sales (FMS) agreements, as well as migrate to new processes via the JEL/ JWS v3.x concept. JTCG/ME is supporting a new JWS FMS case for the U.K. These FMS deliveries complement U.S. interest and capabilities by providing weaponeering and targeting capability to Coalition partners. - Continue to hold information exchange forums under International Energy Agency agreements (i.e. US-UK IEA 1858 and US-ROK IEA 0585). Transition to new US-UK IEA 0864 with new expanded scope. These exchanges facilitate collaboration on			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
methodologies and efforts of mutual interest in the area of weapons effectiveness/collateral damage estimation for both kinetic and non-kinetic weapons. - Develop and fully exercise the Joint Analysis Repository and Visual Interface System (JARVIS) and JEL processes to supply target vulnerability data, weapons characterization data, weapons effectiveness methodology to operational and acquisition communities. The JTCG/ME develops and improves data and methodology used as tri-service standards. A focus of FY 2022 efforts is to continue to migrate data and methodology utilized through the JARVIS and the JEL. In addition, release AJEM v4.22.1, AJEM EF Modules, Target Surrogation Recommendations, Orca Extra Large Unmanned Undersea Vehicle updates, and Fast Air Target Engagement Penetration updates. - JTCG/ME will continue to support and host technical working groups on targets, weapons, and methodology, as forums to share knowledge and build partnerships for greater leveraging, performance, and affordability. Leveraging existing technologies and partnerships have the potential to reduce the number of weapon test articles required and remove labor-intensive activities from weapon testing. - Update and execute strategic roadmaps for underlying vulnerability/lethality models used as standards by the tri-service community to better support JMEMs and DOT&E. These roadmaps align JTCG/ME-funded and related tasks by other services and programs to facilitate leveraging. In addition, the roadmaps provide a tool for future investment planning to support M&S validation and resolution of capability gaps. - Develop, field, and maintain/support DIEE v2.3.1 and v3.0 versions. DIEE v2.3.1 updates include: Risk Estimate Distances (RED) table updates, Tasked Target Text Data (T3D) updates, Modernized Integrated Database (MIDB) Plugin enhancements, Integrated Munitions Effects Assessment (IMEA) Connect, Geospatially Enabled Targeting Materials (GETM) Write and Mensuration Services Program (MSP) 1.6.4/CGS 2.3.8.1.Continue to evolve DIEE as an enterprise targeting solution that provides both seamless planning, linkage to various mission planning systems and tools in operational units. - Continue to develop future DIEE version v3.x with JWS 3.x capabilities plugin/API development. Focused FY 2022 efforts will continue to maintain/improve connectivity to community tools, implement interface with JEL, IMEA, and Collateral Effects Library (CEL) emerging capabilities. In addition, establish connectivity with Android, Variable Message Format (VMF) in support of Dynamic Operations, transition battle damage assessment workflow/data capabilities from BDA analytical efforts, maintain awareness of policy changes to applicable CJCSIs, conversion to Windows Presentation Foundation (WPF), modernize look & feel, integration with JWS v3.0, native 3D viewer (i.e. Generic Point Cloud Model (GPM) data, draw objects, pan/zoom/rotate, render aimpoints & CDE rings), 2D viewer updates (i.e. shadows & highlights), BDA STARLORD interface development and service-oriented architecture (SOA) improvements. The new JWS v3.0 plugin/API design allows DIEE to call directly into the tri-			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
service approved weaponeering calculations engine to support full ATD functions (i.e. Weaponeering, CDE, TCM) at CCMD level, as well as supporting separate weaponeering analysis for Services and planners all in one product. - Develop and accredit Collateral Effects Radii (CER) Reference Tables in accordance with the latest CJCSI 3160.01, “No-Strike and the CDE Methodology” for air-to-surface and surface-to-surface weapons, which are the basic data that support the CDE methodology implemented in DIEE. - Continue to support and deliver reachback analysis packages for collateral damage mitigation, post-forensic, and force protection analyses packages to operational users for high value targets in current operations. These efforts directly assist Combatant Commands to meet commander’s intent and minimize collateral damage. - Continue the Enhanced Weaponeering and CDE Program, a multi-year test program focused on enhancing and validating JTCG/ME CDE tools. This program will support improvements in weaponeering and CDE methodology to minimize risk to mission and risk to forces, while not increasing risk of collateral damage by providing foundational data for the development of higher fidelity predictive tools. Specific efforts will generate buried ordnance characterization data based upon usage statistics from CCMD Expenditure reports, and area of responsibility specific building debris data to enhance and validate current weaponeering/ collateral damage estimation methodologies required by Strike Approval Authorities. FY 2022 efforts will leverage seven FY 2021 testing events and multiple collaboration forums. FY 2022 efforts will include three buried ordnance and three building debris characterization tests, as well as analyzing and transitioning data and findings from previous tests to weaponeering and CDE tools. - Continue to implement the bomb damage assessment for the Deliberate and Dynamic Strikes analysis. The effort is a multi-year task to analyze ongoing strikes required to update JMEM capabilities. The overall objective and intent is to ensure effective and efficient munition expenditure rates and mitigate the stockpile stress, while improving CCMDs’ force effects. In essence, improve the warfighter's ability to get the right weapon on the right target, achieve the desired effect, and minimize collateral damage while optimizing scarce resources. FY 2022 efforts include: continued extraction of new strike data events, further refine strike analysis methodologies to increase automation, further development of new analysis tools obtain end user feedback on new tools for user interfaces, integrate BDA analysis tools with existing JTCG/ME weaponeering applications, shape BDA reporting standards, Landuse Classification, 3D Point Cloud Model Development, Physical Damage Assessment and Building Extraction Tool. - Develop, field, and maintain/support Joint Anti-air Combat Effectiveness (J-ACE) v5.4, which includes multiple training and user forums for the fielded product. These forums are pivotal for J-ACE developers to understand requirements and align development with other external debrief and analytical capabilities that use J-ACE as the underlying analytical engine to underpin results. J-ACE v5.4 enhancements include: User Support/Training - increased v5.3 training, using unclassified web, updating BROWSE			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
documentation resource, Models/Data - new national Time-Space-Position Info (TSPI) format, and Integration - Updated blue AIM-120 and AIM-9x simulations. - Continue integration of Air Combat Effectiveness Library (ACEL) v1.0 capabilities in J-ACE v6.0, which includes Joint Aircraft Survivability Program Survivability and Lethality of Aircraft in Tactical Environments (SLATE) capabilities for Rotary Wing and Low Altitude Combat Weapons. - Continue Cyber JMEM development capabilities with continued execution of multiyear plan to develop/enhance the Cyber Operations Lethality and Effectiveness (COLE) tool. FY 2022 efforts will focus on completion of COLE v2.0 that will include automated fusion of multi-domain estimates, correlation of foundational data to support Operational Environment Model (OEM) generation, preliminary artificial intelligence-based decision support system, OEM analysis and attack planning support, refined integration with other JTCG/ME toolsets, and quantitative comparisons. Similar to other JMEMs, user feedback is critical. - Develop and field Joint Laser Weaponeering Software (JLaWS) tool v2.0 including JTCG/ME Endgame Framework integration, integrate Laboratory/field effects testing and vulnerability analyses. Develop and field High Power Microwave Weapon Systems (HPMWS) v1.0 include continuing HPM lethality testing/target vulnerability analysis/data collection for V&V on service-specific target sets, field-testing, target vulnerability characterization and modeling to provide inputs to JMEM models. - Continue to develop and mature EMS Fires JMEM program and capabilities. FY 2022 efforts will enhance Electronic Attack (EA) effectiveness capability including standardization of data and methods (e.g., approved effectiveness library and services) for EA (offensive jamming) effectiveness for use by the Joint force within operational tools and develop capability to determine weaponeering effects due to The Global Positioning System (GPS) denial. A particular focus will be the implementation of EA methodologies for an initial Joint Electronic Attack Prediction (JEAP) tool. - Weaponeering Tools to Support Strikes in a Contested Maritime Environment. Efforts will enable development of foundational data and analytics based on weaponeering-level, engineering-level, collateral damage estimation, and predictive battle damage assessment methodologies. Plans are being developed/executed to establish an interim Maritime Weaponeering Guide as well as leveraging efforts on Advanced Ship Survivability Program, Maritime Survivability Library and Maritime Lethality Analysis Tool. JTCG/ME will finalize the program plan for approval. The end state is to deliver an improved weaponeering tool capable of producing timely/accurate estimates with current/future kinetic/non-kinetic weapons to include required aimpoints to achieve the desired lethal effect against maritime targets (surface and subsurface).			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Support the Joint Targeting Intelligence (JTI) requirements roadmap as a bridge to the FY 2023 increase. Of the 25 requirements being addressed, 17 are in relation to scaling DIEE to meet the needs of the targeting enterprise. ***FY 2023 Plans:*** JLF The FY 2023 budget will align with DOT&E's S&T Strategic Plan, National Defense Strategy objectives, and SECDEF priorities. It will support a more lethal force by increasing the accuracy and capability of critical M&S tools to support T&E efficiency and ensure credibility of DOD assessments and weaponeering tools. The FY 2023 program will continuously focus on multi-year initiatives such as Verification, Validation and Accreditation standardization including model uncertainty quantification and experimentation measurement uncertainty, warhead lethality, data analytics, and maritime modeling M&S enhancements. JLF efforts will also resolve survivability and lethality related system design challenges of currently fielded U.S. systems while maintaining awareness of LFT&E challenges across all air, ground, and sea domains. Finally, JLF will continue to lead innovation in LFT&E methods to increase LFT&E efficiency and support rapid fielding. JASP In FY 2023, the JASP will continue work on multi-year RDT&E projects and initiate new projects approved by the JASP PMSG and OSD/DOT&E. The JASP will support the NDS objective to 'Build a More Lethal Force' by developing measures to improve threat situational awareness, defeat near-peer adversary radio frequency and infrared guided threats, and provide quantifiable improvements in digital and hardware-in-the-loop M&S capability and credibility. Improve aircraft force protection by advancing system hardening against kinetic and non-kinetic threats. 'Reform the DoD for Greater Performance and Affordability' by funding the development of more efficient capabilities to development, test and evaluate aircraft survivability against kinetic and non-kinetic threats. The JCAT will continue to support the Air Force, Army, Marine Corps and Navy by assessing combat damage incidents, training operators on threat effects and combat damage assessment, and reporting their findings to combatant commanders and the DoD science and technology and acquisition communities. The JASP will continue supporting aircraft survivability education and information exchange through internet sites (restricted access and classified), by publishing the Aircraft Survivability Journal, developing educational materials and conducting training for the DoD and their contractors. The JASP will initiate, continue and complete other projects as approved by the JASP Principal Members Steering Group and OSD/DOT&E. JTCG/ME - Develop and field JWS v3.0 capabilities plugin within JWS/ DIEE v3.0. Specific development events will include Technical Previews 11, 12, and 13 to finish/field JWS v3.0 and transition to JWS v3.1 development. The JWS v3.x architecture allows greater leveraging and sharing of Service based model and simulation capabilities. The new JWS v3.0 plugin/API design allows			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
DIEE to call directly into the Tri-service approved weaponeering calculations engine to support full ATD functions (Weaponeering, CDE, TCM) at CCMD level, as well as supporting separate weaponeering analysis for Services and planners all in one product. - Continue to enhance JEL capabilities to serve as the foundation of JWS/DIEE v3.x product line Tri-service approved methodology and data. JEL capabilities include new/updated trajectory modeling, new weapon/targets database designs/data and user interfaces, enhanced structural target response and prediction, personnel and ground mobile vulnerability methods, API, and JEL model Smart Book. FY 2023 efforts will include continued development of capabilities, which include collateral effects radii tables, enhanced collateral damage mitigation, new ground mobile target capability/data, and continue evolution of new maritime operational weaponeering tool. - Support requirements collection by hosting JMEM training sessions, OUWG, and User help desk via the Joint Product Information Access System (JPIAS). JTCG/ME will support approximately 30 training sessions anticipating about 400 students annually. JTCG/ME will collect User requirements and product use cases, to process and codify in capability needs statements used for planning and JMEM product development. Requirement management tools will track requirements lifecycle through development and completion; provide context to leadership, analysts and developers without breaking flow: and align Requirements activities with current DevSecOps guidance. - Facilitate coalition interoperability and information exchange forums. JTCG/ME will continue to support/deliver JWS version releases (ROK JWS, JWS v2.4.x for ACGU, JWS for UK) and standalone Probability of Kill Lookup tools to multiple key coalition partners in support of current operations under FMS agreements, as well as continue to migrate to JEL/JWS v3.x concepts. These FMS deliveries complement U.S. interest and capabilities by providing weaponeering and targeting capability to Coalition partners. - Continue to hold information exchange forums under IEA agreements (US-UK IEA 0864 and US-ROK IEA 0585). These exchanges facilitate collaboration on methodologies and efforts of mutual interest in the area of weapons effectiveness/collateral damage estimation for both kinetic and non-kinetic weapons. These IEAs support the 'National Defense Strategy -Strengthen Alliances and Attract New Partners', specifically by supporting Warfighters in achieving weaponeering interoperability. - Use and enhance the JARVIS and JEL processes to supply target vulnerability data, weapons characterization data, weapons effectiveness methodology to operational and acquisition communities. The JTCG/ME develops and improves data and methodology used as tri-service standards. A focus of FY 2023 efforts is to deliver new materiel and maritime data and methods to JWS and DIEE. - Continue to support and host technical working groups in targets, weapons, and methodology, as forums to share knowledge and build partnerships for greater leveraging, performance, and affordability. Leveraging existing technologies and partnerships			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
have the potential to reduce the number of weapon test articles required and remove labor-intensive activities from weapon testing. - Update/execute strategic roadmaps for underlying vulnerability/lethality models used as standards by the tri-service community to better support JMEMs and DOT&E. These roadmaps align JTCG/ME funded and related tasks by other services and programs to facilitate leveraging. In addition, the roadmaps provide a tool for future investment planning to support modeling/simulation validation and resolution of capability gaps. - Develop/field DIEE v3.1 with JWS 3.x capabilities plugin/API in accordance with Joint Staff policy. Continue to evolve DIEE as an enterprise targeting solution that provides both seamless planning, linkage to various mission planning systems and tools in operational units. Efforts include maturing DIEE/JWS version v3.x with JWS 3.x capabilities linkage, but also maintain and grow connectivity to community capabilities such as JEL, IMEA, CEL, BDA analytical efforts, and other emerging capabilities for all domain targeting. The new JWS v3.0 plugin/API design allows DIEE to call directly into the Tri-service approved weaponeering calculations engine to support full ATD functions (Weaponeering, CDE, TCM) at CCMD level, as well as supporting separate weaponeering analysis for Services and planners all in one product. - Develop and accredit CER Reference Tables in accordance with the latest CJCSI 3160.01, “No-Strike and the CDE Methodology” for air-to-surface and surface-to-surface weapons, which are the basic data that support the CDE methodology implemented in DIEE. - Continue to support/deliver reachback analysis packages for collateral damage mitigation, post-forensic, and force protection analyses packages to operational Users for high value targets in current operations. These efforts directly assist Combatant Commands to meet commander’s intent and minimize collateral damage. - Continue the Enhanced Weaponeering and CDE Program will support improvements in weaponeering and CDE methodology to minimize risk to mission and risk to forces, while not increasing risk of collateral damage by providing foundational data for the development of higher fidelity predictive tools. FY 2023 will continue to community collaboration and focus on continuing to leverage data from the multiple tests to enhance, develop, and validate methodology used in JMEM products. Other efforts will include specialized/focused tests based on lessons learned. - Continue BDA of Deliberate and Dynamic Strikes analysis program. FY 2023 efforts include: continue to extraction and analyze strike data events, enhance BDA tools to include automation and integration of 3D models in JWS/DIEE, support BDA reporting standards, field combat damage assessment tool, maintain/support fielded tools, and collect User feedback.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605131OTE / *Live Fire Test and Evaluation (LFT&E)*	**Project (Number/Name)** 000311 / *LFT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Support fielded version of J-ACE v5.4, which includes multiple training and user forums for the fielded product. These forums are pivotal for J-ACE developers to understand requirements and align development with other external debrief/analytical capabilities that use J-ACE as the underlying analytical engine for underpinning results and enabling air combat TTP development at test and training ranges. - Develop and field J-ACE v6.0. The new J-ACE v6.0 product line will leverage Air Combat Effectiveness Library (ACEL) v1.0 capabilities. The architecture allows for greater leveraging and sharing of Service and Intel community based model and simulation capabilities to include rotary wing, low altitude combat weapons, and high fidelity air-to-air missile modeling capabilities. - Continue enhancement of Cyber JMEM capabilities in new versions of COLE tool. FY 2023 efforts will focus on completion of COLE v3.0 to include new requirements from Operational user community, such as greater automation, pattern of life analysis, User experience, and connection to other JMEMs for greater all domain capability. A focus will continue to be expanding User base and increased User feedback for product enhancement. - Support/maintain JLaWS tool v2.0. Develop and field JLaWS tool v3.0 to include new weapon systems, target vulnerability characterization, and enhancements from continued test and analytical events. Increase connectivity to other JMEMs for greater all domain capability. - Support/maintain HPMWS v1.0. Develop and field HPMWS v2.0 to include enhancements from HPM lethality testing, target vulnerability analysis, and data collection. - Develop/implement EMS Fires (Electronic Attack) JMEM capabilities. FY 2023 efforts will include fielding of initial JEAP tool v1.0, as well as continue to maintain/refine EA effectiveness (offensive jamming) data standards, collect/approve data, collaborate with User/ Mission Planning community for requirements refinement, and implement convergence and BDA capabilities. These efforts will provide the Joint targeteers and mission planners with standard data sets and methodologies for capabilities analysis/ weaponeering and mission planning. The program will also continue to implement validation efforts for GPS analysis capabilities to determine Weaponeering effects due to GPS Denial. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 Weaponeering Tools to Support Strikes in a Contested Maritime Environment Increase: The Weaponeering Tools to Support Strikes in a Contested Maritime Environment initiative will enable the ability to bring Joint Fires to bear in a maritime action by providing a joint-service approved, scene-based Maritime Operational Weaponeering Tool			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605131OTE / *Live Fire Test and Evaluation (LFT&E)*	**Project (Number/Name)** 000311 / *LFT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
that can assess weapons effects and optimize weapon allocation. Funding will used to achieve the following: (1) Development of appropriate weaponeering prediction models (JMEMs for maritime threats), (2) Delivery of critical data to improve lethal effect estimate methodologies, (3) Development of target geometry models for prioritized surface and subsurface maritime targets, (4) Development of weaponeering-level, engineering-level, collateral damage estimation, and predictive battle damage assessment methodologies required by Strike Approval Authorities to make their strike decision calls, and (5) Improvement of supporting engineering models to analyze weapon effectiveness, weapon characteristics, delivery accuracy, reliability, and target vulnerabilities. This initiative will increase force-wide lethality by providing Combatant Commanders with improved capability to plan and execute missions in a contested maritime environment. It will deliver a weaponeering tool capable of timely and accurate estimates with current and future kinetic/non-kinetic weapons and the required aim points to achieve the desired lethal effect against maritime targets (surface and subsurface). More specifically, this enhancement will enable the development of data and analytics based operational tools significantly improving the ability to prosecute high value maritime targets in the INDOPACOM, CENTCOM and EUCOM AORs, while producing salvo tables that will reduce over-allocation of ordnance in an already low-density, high-demand environment. FY 2023 Joint Targeting Intelligence (JTI) Increase: JTCG/ME funding will support investment in Joint Targeting Intelligence (JTI) modernization. JTI is the Joint Staff J2's portion of the Joint Targeting Cycle that selects, analyzes, and prioritizes targets and then assesses the results of the application of military force. JTI drives the operations process of linking desired effects to tasks in order to meet the Commander's objectives. This initiative will align the doctrine/ modernize the architecture that governs targeting with the tools that are used for weaponeering, collateral damage estimation, combat assessment, and munitions effectiveness assessment across the CCMDs and Services. JTI Requirements Definition Package includes 25 requirements for the targeting enterprise to be addressed by selected targeting tools (i.e. Digital Imagery Exploitation Engine (DIEE)/JMEM Weaponeering System (JWS), Joint Targeting Toolbox (JTT), Modernized Integrated Database (MIDB), and Integrated Munitions Effects Assessment (IMEA)). JTCG/ME, in coordination with Joint Staff J2 and OUSD (I&S), will evolve DIEE/JWS and the DOD's battle damage assessment repository to meet the emerging requirements of the JTI (e.g., Common Data Models in data centric environment), with the goal of providing capabilities to the targeting enterprise that evolve with current technological demands.			
Accomplishments/Planned Programs Subtotals	74.048	68.549	99.947

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605131OTE / *Live Fire Test and Evaluation (LFT&E)*	**Project (Number/Name)** 000311 / *LFT&E*

	FY 2021	FY 2022
Congressional Add: Program Increase: Lab and Test Range Upgrades	-	35.000
FY 2022 Plans: The program increase will fund Operational Test and Evaluation investments in test infrastructure to demonstrate new capabilities under operationally relevant conditions against realistic threats for lab and test range upgrades in the following: space, electromagnetic spectrum, hypersonics, and targets.		
Congressional Adds Subtotals	-	35.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Operational Test and Evaluation, Defense	Date: April 2022
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605814OTE / *Operational Test Activities and Analyses*

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	65.237	69.939	67.648	57.718	-	57.718	58.693	59.477	59.888	59.572	Continuing	Continuing
000920: *OTA&A*	65.237	69.939	67.648	57.718	-	57.718	58.693	59.477	59.888	59.572	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Operational Test Activities and Analyses (OTA&A) programs are continuing efforts that provide management and oversight of test and evaluation functions and expertise to the Department of Defense (DoD). The OTA&A programs consist of three activities: Joint Test and Evaluation (JT&E); Test and Evaluation Threat Resource Activity (TETRA); and Center for Countermeasures (CCM).

JT&E projects are T&E activities conducted in a joint military environment that develop process improvements. These multi-Service projects, chartered by the Office of the Secretary of Defense and coordinated with the Joint Staff, CCMDs, and the Services, provide non-materiel solutions that improve the following: joint interoperability of Service systems, technical and operational concepts, joint operational issues, development and validation of joint test methodologies, and test data for validating models, simulations, and test beds. New projects are also encouraged to align their efforts to support the National Defense Strategy. The JT&E projects address relevant joint warfighting issues in a joint test and evaluation environment by developing and providing new tactics, techniques, and procedures to improve joint capabilities and methodologies.

Test and Evaluation Threat Resource Activity (TETRA), based on a memorandum of agreement between the DOT&E and the Defense Intelligence Agency, provides DOT&E support in the areas of threat resource analysis, intelligence support and threat systems investments. As DOT&E's agent, TETRA provides threat resource analyses on the availability, capabilities and limitations of threat representations (threat simulators, targets, models, U.S. surrogates, and foreign materiel) and analysis of test resources used for operational testing to support DOT&E's assessment of the adequacy of testing for those programs designated for oversight by DOT&E and the Office of the Under Secretary of Defense Acquisition and Sustainment (OUSD (A&S)). TETRA provides DOT&E action officers and other DOT&E activities with program-specific threat intelligence support. TETRA also funds management, oversight, and the actual development of common-use threat specifications for threat simulators, threat representative targets, and digital threat models used for T&E.

The Center for Countermeasures (CCM), a Joint Service Countermeasure (CM) T&E activity, directs, coordinates, supports, and conducts independent countermeasure/counter-countermeasure (counter-CM) T&E activities of U.S. and foreign weapon systems, subsystems, sensors, and related components. CCM accomplishes this work in support of DOT&E, weapon system developers, and the Services.
CCM's testing and analyses directly supports evaluations of the operational effectiveness and suitability of CM/counter-CM systems, such as aircraft survivability equipment (ASE) used on rotary-wing and fixed-wing aircraft. CCM's mission to support T&E of ASE enables the survivability of aircraft in a high threat environment to enable mission success. In addition, CCM provides test support for Directed Energy Weapons (DEW) and Counter-Unmanned Aircraft Systems (C-UAS) programs. CCM improves Service member exercises, training, and pre-deployment activities with expertise in CM/counter-CM technology and capabilities. Also, cooperative Allied efforts are supported in the areas of ASE T&E, DEW T&E, and threat M&S development.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Operational Test and Evaluation, Defense	Date: April 2022
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605814OTE / *Operational Test Activities and Analyses*

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	69.939	42.648	0.000	-	0.000
Current President's Budget	69.939	67.648	57.718	-	57.718
Total Adjustments	0.000	25.000	57.718	-	57.718
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	25.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-	-	57.718	-	57.718

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 000920: *OTA&A*		
Congressional Add: *Program Increase: Lab and Test Range Upgrades*	-	25.000
Congressional Add Subtotals for Project: 000920	-	25.000
Congressional Add Totals for all Projects	-	25.000

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding. FY 2023 programmatic increase from FY 2022 reflects restoral of the Joint Test and Evaluation program funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense			Date: April 2022
Appropriation/Budget Activity 0460 / 6	R-1 Program Element (Number/Name) PE 0605814OTE / *Operational Test Activities and Analyses*	Project (Number/Name) 000920 / *OTA&A*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
000920: *OTA&A*	65.237	69.939	67.648	57.718	-	57.718	58.693	59.477	59.888	59.572	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Operational Test Activities and Analyses (OTA&A) programs are continuing efforts that provide management and oversight of test and evaluation functions and expertise to the Department of Defense (DoD). The OTA&A programs consist of three activities: Joint Test and Evaluation (JT&E); Test and Evaluation Threat Resource Activity (TETRA); and Center for Countermeasures (CCM).

JT&E projects are T&E activities conducted in a joint military environment that develop process improvements. These multi-Service projects, chartered by the Office of the Secretary of Defense and coordinated with the Joint Staff, CCMDs, and the Services, provide non-materiel solutions that improve the following: joint interoperability of Service systems, technical and operational concepts, joint operational issues, development and validation of joint test methodologies, and test data for validating models, simulations, and test beds. New projects are also encouraged to align their efforts to support the National Defense Strategy. The JT&E projects address relevant joint warfighting issues in a joint test and evaluation environment by developing and providing new tactics, techniques, and procedures to improve joint capabilities and methodologies.

Test and Evaluation Threat Resource Activity (TETRA), based on a memorandum of agreement between the DOT&E and the Defense Intelligence Agency, provides DOT&E support in the areas of threat resource analysis, intelligence support and threat systems investments. As DOT&E's agent, TETRA provides threat resource analyses on the availability, capabilities and limitations of threat representations (threat simulators, targets, models, U.S. surrogates, and foreign materiel) and analysis of test resources used for operational testing to support DOT&E's assessment of the adequacy of testing for those programs designated for oversight by DOT&E and the Office of the Under Secretary of Defense Acquisition and Sustainment (OUSD (A&S)). TETRA provides DOT&E action officers and other DOT&E activities with program-specific threat intelligence support. TETRA also funds management, oversight, and the actual development of common-use threat specifications for threat simulators, threat representative targets, and digital threat models used for T&E.

The Center for Countermeasures (CCM), a Joint Service Countermeasure (CM) T&E activity, directs, coordinates, supports, and conducts independent countermeasure/counter-countermeasure (counter-CM) T&E activities of U.S. and foreign weapon systems, subsystems, sensors, and related components. CCM accomplishes this work in support of DOT&E, weapon system developers, and the Services.
CCM's testing and analyses directly supports evaluations of the operational effectiveness and suitability of CM/counter-CM systems, such as aircraft survivability equipment (ASE) used on rotary-wing and fixed-wing aircraft. CCM's mission to support T&E of ASE enables the survivability of aircraft in a high threat environment to enable mission success. In addition, CCM provides test support for Directed Energy Weapons (DEW) and Counter-Unmanned Aircraft Systems (C-UAS) programs. CCM improves Service member exercises, training, and pre-deployment activities with expertise in CM/counter-CM technology and capabilities. Also, cooperative Allied efforts are supported in the areas of ASE T&E, DEW T&E, and threat M&S development.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605814OTE / *Operational Test Activities and Analyses*	**Project (Number/Name)** 000920 / *OTA&A*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Operational Test Activities and Analyses	69.939	42.648	57.718

Description: The Operational Test Activities and Analyses (OTA&A) programs are continuing efforts that provide management and oversight of T&E functions and expertise to the DOD. The OTA&A programs consist of three activities: Joint Test and Evaluation (JT&E); Test and Evaluation Threat Resource Activity (TETRA); and, the Center for Countermeasures (CCM).

FY 2022 Plans:

Joint Test and Evaluation (JT&E)

In FY 2022, JT&E plans to close one project that started in FY 2019 and two projects that started in FY 2021. The first project is the Joint Interoperability through Data Centricity Joint Test, which closed in October 2021. It developed tactics, techniques, and procedures that enable Combatant Commands to rapidly and efficiently share operational data with appropriate mission partners without establishing separate networks for each unique set of partners. The second project is the Joint Integrated Fire Control – Directed Energy Weapons for Air Defense Joint Test, which is anticipated to close in August 2022. It is developing a concept of employment to integrate directed energy and kinetic fires with command and control authorities to maximize self-defense and minimize collateral damage. The third project is the Recovery Enhanced by Synchronizing Capabilities to Unify Effects Joint Test, which is anticipated to close in August 2022. It is developing and testing tactics, techniques, and procedures to integrate and synchronize information-related capabilities across all-domains with personnel recovery operations to enable support and recovery of isolated personnel in an anti-access/area denial environment. Upon the appropriation of FY 2022 funding, the JT&E program will charter additional projects commensurate with that funding. New projects will be nominated by Combatant Commands, Services, and Office of the Secretary of Defense agencies; representatives of these same organizations will prioritize the nominated projects for the available funding.

Test and Evaluation Threat Resource Activity (TETRA)

In FY 2022, Threat Systems will continue test planning working group participation and perform technical analyses to identify threat shortfalls; aligns with the NDS requirements; conduct special studies and provide current intelligence support tailored to specific U.S. weapon systems acquisitions based on the availability of funding. Threat Systems will:

- Execute initiatives that directly influence or improve the areas of software intensive systems and cybersecurity.
- Execute initiatives by moving to digital engineering via accredited models and simulation.
- Execute initiatives to “Shift Left” with integrated developmental and operational testing.
- Execute initiatives to improve the test environments.
- Execute initiatives of growing importance on human-system interaction.
- Execute initiatives of adapting T&E for emergent technologies.
- Execute initiatives to develop test capability for emerging technologies within the space and hypersonics arena to address current and potential threats.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605814OTE / *Operational Test Activities and Analyses*	**Project (Number/Name)** 000920 / *OTA&A*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Execute initiatives to understand and develop T&E infrastructure, tools and processes for emerging capabilities and threats (i.e. hypersonics, directed energy, artificial intelligence, machine learning, infrared (IR) and radio frequency (RF), 5th Generation Aerial Target (5GAT), automated & autonomous cybersecurity testing, and neural networks.) - Continue to support the reduction in acquisition and test timelines while increasing test capabilities against near peer threats. - Continue to foster rapid technological advancements in the areas of threat representation for T&E and threat test resources by incorporating innovative technologies from the intelligence community into threat test assets to provide improved test fidelity and performance with cost savings. - Continue identifying initiatives to improve cyberspace threat representation and prediction, cyber-economic threats to DOD systems and scalable cyberspace threat test environments that can interface with cyber test networks. - Continue identifying initiatives to conduct offensive cyber operations (OCO) and defensive cyber operations (DCO) without significantly impacting critical operational capabilities. - Continue the development of an Advanced Satellite Navigation Receiver (ASNR) for an open service Global Positioning System / Inertial Measurement Unit (GPS/IMU) coupled high-fidelity, high dynamic next generation Time Space Position Information (TSPI) system to support future missile tests and Joint Standard Instrumentation Suite (JSIS) flight testing. - Complete implementation of Combined Federated Battle Laboratories Network (CFBLNet)) to develop network capability that will support the Multi National Test and Evaluation Program (MTEP) TMAP ITASE Chimera Live Environment (MTICLE) test requirements with Coalition partners. - Continue development of cognitive radar definition, intelligence assessment of foreign AI cognitive capability, and white paper to develop model for testing against advanced cognitive radar threats. - Continue to pursue initiatives for improving satellite and space threat representations and developing alternatives for conducting threat realistic operational testing in response to environmental limitations. - Continue to support the U.S. warfighter by providing threat intelligence relevant to emerging threats such as artificial intelligence, autonomy, robotics, directed energy, hypersonic and biotechnology to ensure operational and developmental testing occurs against realistic threat representations, including (but not limited to) threats from both revisionist powers such as China and Russia threats from rogue regimes such as North Korea and Iran, and threats from non-state actors. - Continue to conduct threat intelligence investigations that support use of innovative technologies in the areas of AI, autonomy, robotics, machine learning (ML), quantum computing, lasers, nanotechnology, chemical and biological, directed energy, hypersonic and biotechnology being developed by nation states to improve threat representation in the contested domain of air, land, sea, space and cyberspace. - Continue to support initiatives for the development of Great Power threat representative jammers, for use in terrain constricted tests as a directional active electronically steered array jammer that will limit Federal Aviation Administration and other common jammer restrictions/acceptance/endorsement for T&E use.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605814OTE / *Operational Test Activities and Analyses*	**Project (Number/Name)** 000920 / *OTA&A*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Continue to sustain and manage threat M&S to support test and evaluation by overseeing and coordinating intelligence community developed threat models, performing threat model anomaly resolution resolving differences from live fire testing, integrating threat models into T&E facilities and distributing performance and signature models to T&E users. - Continue to represent DOT&E at foreign material exchanges, NATO, Allied Intelligence, inter-agency coordinating groups, and non-proliferation groups to raise awareness of T&E needs for foreign materiel, coordinate service requirements, and de-conflict and prioritize foreign materiel requirements for T&E. - Continue to provide intelligence support to DOT&E staff to address specific questions on threat systems affecting programs on the OSD T&E Oversight list and provide briefings and special intelligence reports when necessary. - Continue providing DOT&E representative support at the Threat Steering Group (TSG) in support of the Validated Online Lifecycle Threat (VOLT) Report process. - Continue to represent DOT&E interests on the Intelligence Acquisition Agility Working Group (IAAWG) and - Continue to represent DOT&E at the Intelligence Mission Data Oversight Board responsible for development, production and sharing issues affecting the intelligence data supporting weapons systems acquisition. - Continue to serve DOT&E's interests on the Executive Steering Group (ESG) and provide access to the Intelligence Mission Data Management Analysis & Reporting System (IMARS). - Continue to manage Integrated Technical Evaluation and Analysis of Multiple Sources (ITEAMS) efforts supporting programs on the OSD Oversight T&E List by conducting intelligence "deep dives" to produce intelligence in sufficient detail to develop new threat test assets. - Continue the independent review of validation reports to ensure the correct threat data and critical parameters are presented in the reports to assess the threat representations' capabilities to replicate a real-world threat system. - Oversee legacy DOT&E investments and continue management and oversight of legacy and new Test Resource Management Center-funded threat system investments. - Continue to provide threat intelligence and validation support at the JASP reviews to ensure there is no duplication of effort and independently ensure the correct threat data and critical parameters are presented to assess the real-world threat representations. - Continue to serve as the T&E Resources and Infrastructure Working Group (RIWG) DOT&E lead for Targets and Threat Systems investments. - Serve as the DOT&E agent for oversight in the coordination, development and execution of all Test Resource Management Center-funded projects within RIWG's Strategic and Foundational Portfolios. - Continue reviewing Threat Systems investments to prevent any duplication of effort and encourage cost savings by the sharing or multi-service use of newly developed threat representations to T&E. - Continue to lead Allied and NATO initiatives, tests, intelligence, and modeling and simulation collaborative capability. Threat Systems will continue its efforts to improve significantly the standards set of threat performance models as the global threat environment evolves. Funds requested for these activities help DOT&E carry out its Title 10 responsibilities to assess			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605814OTE / *Operational Test Activities and Analyses*	**Project (Number/Name)** 000920 / *OTA&A*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
test adequacy and determine whether testing is threat realistic and suitable, promotes common solutions to Service threat representation needs and ultimately supports the warfighter. The Center for Countermeasures (CCM) CCM will continue to emphasize support of the DOT&E enterprise, with a clear focus on Title 10 oversight programs, Aircraft Survivability Equipment (ASE), Directed Energy Weapon (DEW), Counter-Unmanned Aircraft System (C-UAS), and warfighter training events. CCM expects to increase focus on DEW and other critical technology areas, which will contribute to the testing of future weapons and the understanding of emerging threats. CCM's ability to provide unique test equipment and expertise will remain a benefit to all Services, and the ongoing Improvement and Modernization plans will ensure test capabilities are provided at a cost savings across the DoD. Additional instrumentation, personnel, and training will be key to ensuring our ongoing test support continues to add significance in emerging technology areas. CCM will continue to build critical test and evaluation capabilities and the workforce necessary to evaluate emerging DEW war fighting technologies. This includes mobile, open-air DEW data collection and analysis capabilities that will support the T&E of the rapid prototyping and fielding needs of these systems. The mobile test capability will allow T&E of operational representative test scenarios in an open air environment to support the accelerated development and fielding of DEW within the DoD.			
FY 2023 Plans: Joint Test and Evaluation (JT&E) In FY 2023, JT&E plans to start one new Joint Test project and five new Quick Reaction Test projects. With restored fiscal year funding profiles, JT&E plans to convene senior leader boards to find efficiencies in the program's processes and start new projects that address relevant joint warfighting issues in a joint test and evaluation environment. Test and Evaluation Threat Resource Activity (TETRA) In FY 2023, Threat Systems will continue test planning working group participation and perform technical analyses to identify threat shortfalls; aligns with the National Defense Strategy (NDS) requirements; conduct special studies and provide current intelligence support tailored to specific U.S. weapon systems acquisitions based on the availability of funding. Threat Systems will: - Execute initiatives that directly influence or improve the areas of Software Intensive Systems and Cybersecurity. - Execute initiatives by moving to Digital engineering via accredited models and simulation. - Execute initiatives to "Shift Left" with Integrated Developmental and Operational Testing. - Execute initiatives to Improve the Test Environments. - Execute initiatives of Growing Importance on Human-System Interaction. - Execute initiatives of Adapting T&E for Emergent Technologies. - Execute initiatives to develop test capability for emerging technologies within the Space and Hypersonics arena to address current and potential threats.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605814OTE / *Operational Test Activities and Analyses*	**Project (Number/Name)** 000920 / *OTA&A*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Execute initiatives to understand and develop T&E infrastructure, tools and processes for emerging capabilities and threats (hypersonics, directed energy, artificial intelligence, machine learning, infrared (IR) and radio frequency (RF), 5th Generation Aerial Target (5GAT), automated & autonomous cybersecurity testing, and neural networks. - Continue to support the reduction in acquisition and test timelines while increasing test capabilities against Great Power threats. - Continue to foster rapid technological advancements in the areas of threat representation for T&E and threat test resources by incorporating innovative technologies from the intelligence community into threat test assets to provide improved test fidelity and performance with cost savings. - Continue identifying initiatives to improve cyberspace threat representation and prediction, cyber-economic threats to DoD systems and scalable cyberspace threat test environments that can interface with cyber test networks. - Continue identifying initiatives to conduct offensive cyber operations (OCO) and defensive cyber operations (DCO) without significantly impacting critical operational capabilities. - Based on the availability of funding, complete the development of an Advanced Satellite Navigation Receiver (ASNR) for an open service Global Positioning System / Inertial Measurement Unit (GPS/IMU) coupled high-fidelity, high dynamic next generation Time Space Position Information (TSPI) system to support future missile tests and Joint Standard Instrumentation Suite (JSIS) flight testing. - Develop and build threat representative decoys and shells to support tests conducted on the ranges. - Complete development of cognitive radar definition and white paper to develop model for testing against advanced cognitive radar threats. - Continue to pursue initiatives for improving satellite and space threat representations and developing alternatives for conducting threat realistic operational testing in response to environmental limitations. - Continue to support the US warfighter by providing threat intelligence relevant to emerging threats such as artificial intelligence, autonomy, robotics, directed energy, hypersonic and biotechnology to ensure operational and developmental testing occurs against realistic threat representations, including (but not limited to) threats from both revisionist powers such as China and Russia threats from rogue regimes such as North Korea and Iran, and threats from non-state actors. - Continue to conduct threat intelligence investigations that support use of innovative technologies in the areas of artificial intelligence (AI), autonomy, robotics, machine learning (ML), quantum computing, lasers, nanotechnology, chemical and biological, directed energy, hypersonic and biotechnology being developed by nation states to improve threat representation in the contested domain of air, land, sea, space and cyberspace. - Continue to support initiatives for the development of Great Power threat representative jammers, for use in terrain constricted tests as a directional active electronically steered array jammer that will limit Federal Aviation Administration and other common jammer restrictions/acceptance/endorsement for T&E use. - Continue to sustain and manage threat M&S to support test and evaluation by overseeing and coordinating intelligence community developed threat models, performing threat model anomaly resolution resolving differences from live fire testing, integrating threat models into T&E facilities and distributing performance and signature models to T&E users.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Operational Test and Evaluation, Defense		Date: April 2022
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Continue to represent DOT&E at foreign material exchanges, inter-agency coordinating groups, and non-proliferation groups to raise awareness of T&E needs for foreign materiel, coordinate service requirements, and de-conflict and prioritize foreign materiel requirements for T&E. - Continue to provide intelligence support to DOT&E staff to address specific questions on threat systems affecting programs on the OSD T&E Oversight list and provide briefings and special intelligence reports when necessary. - Continue providing DOT&E representative support at the Threat Steering Group (TSG) in support of the Validated Online Lifecycle Threat (VOLT) Report process. - Continue to represent DOT&E interests on the Intelligence Acquisition Agility Working Group (IAAWG) and - Continue to represent DOT&E at the Intelligence Mission Data Oversight Board responsible for development, production and sharing issues affecting the intelligence data supporting weapons systems acquisition. - Continue to serve DOT&E's interests on the Executive Steering Group (ESG) and provide access to the Intelligence Mission Data Management Analysis & Reporting System (IMARS). - Continue to manage Integrated Technical Evaluation and Analysis of Multiple Sources (ITEAMS) efforts supporting programs on the OSD Oversight T&E List by conducting intelligence "deep dives" to produce intelligence in sufficient detail to develop new threat test assets. - Continue ITEAMS efforts leading to the development of new threat systems for T&E. - Continue the independent review of validation reports to ensure the correct threat data and critical parameters are presented in the reports to assess the threat representations' capabilities to replicate a real-world threat system. - Oversee legacy DOT&E investments and continue management and oversight of legacy and new Test Resource Management Center-funded threat system investments. - Continue to provide threat intelligence and validation support at the Joint Aircraft Survivability Program (JASP) reviews to ensure there is no duplication of effort and independently ensure the correct threat data and critical parameters are presented to assess the real-world threat representations. - Continue to serve as the Test and Evaluation (T&E) Resources and Infrastructure Working Group (RIWG) DOT&E lead for Targets and Threat Systems investments. - Continue to serve as the DOT&E agent for oversight in the coordination, development and execution of all Test Resource Management Center-funded projects within RIWG's Strategic and Foundational Portfolios. - Continue reviewing Threat Systems investments to prevent any duplication of effort and encourage cost savings by the sharing or multi-service use of newly developed threat representations to T&E. - Continue to lead Allied and NATO initiatives, tests, intelligence, and modeling and simulation collaborative capability. Threat Systems will continue its efforts to improve significantly the standards set of threat performance models as the global threat environment evolves. Funds requested for these activities help DOT&E carry out its Title 10 responsibilities to assess test adequacy and determine whether testing is threat realistic and suitable, promotes common solutions to Service threat representation needs and ultimately supports the warfighter.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
- Continue to create standard operating procedures for DOT&E Action Officer intelligence support to reduce risk and capability. The Center for Countermeasures (CCM) CCM will continue to emphasize support of the DOT&E enterprise, with a clear focus on Title 10 oversight programs, ASE, DEW, C-UAS, and warfighter training events. CCM expects to increase focus on additional DoD critical technology areas that may have T&E gaps, which will contribute to the testing of future weapons and the understanding of emerging threats. CCM's ability to provide unique test equipment and expertise will remain a benefit to all Services, and the ongoing Improvement and Modernization plans will ensure test capabilities are provided at a cost savings across the DoD. Additional instrumentation, personnel, and training will be key to ensuring our ongoing test support continues to add significance in emerging technology areas. CCM will continue to build critical test and evaluation capabilities and the workforce necessary to evaluate emerging war fighting technologies. This includes mobile, open-air data collection and analysis capabilities that will support the T&E of the rapid prototyping and fielding needs of these systems. The mobile test capability will allow T&E of operational representative test scenarios in an open air environment to support the accelerated development and fielding of CM systems within the DoD. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** FY 2023 programmatic increase from FY 2022 reflects restoral of the Joint Test and Evaluation program funding.			
Accomplishments/Planned Programs Subtotals	69.939	42.648	57.718

	FY 2021	FY 2022
Congressional Add: Program Increase: Lab and Test Range Upgrades	-	25.000
FY 2022 Plans: The program increase will fund Operational Test and Evaluation investments in test infrastructure to demonstrate new capabilities under operationally relevant conditions against realistic threats for lab and test range upgrades in the following: directed energy and targets.		
Congressional Adds Subtotals	-	25.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A