

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604800M / <i>Joint Strike Fighter (JSF) - EMD</i>
--	---

COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	51,167.708	1.708	0.561	0.577	-	0.577	-	-	-	-	-	-
2262: <i>Joint Strike Fighter EMD STOVL</i>	51,167.708	1.708	0.561	0.577	-	0.577	-	-	-	-	-	-

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 198

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the USN, USAF, USMC and allies. The three variants are the F-35A Conventional Takeoff and Landing; F-35B Short Takeoff and Vertical Landing; and the F-35C Aircraft Carrier suitable variant. The F-35A will be a stealthy multi-role aircraft, primary air-to-ground for the Air Force to replace the F-16 and A-10 and complement the F-22. The F-35B variant will be a multi-role strike fighter aircraft to replace the AV-8B and F/A-18 for the Marine Corps, replace the Sea Harrier and GR 7 for the United Kingdom, and replace the AV-8 currently employed by the Italian Navy. The F-35C will provide the Department of the Navy a multi-role, stealthy strike fighter aircraft to complement the F/A-18E/F.

The United Kingdom, Italy, Netherlands, Canada, Australia, Denmark, Norway, and Foreign Military Sales customers are also participants in the JSF program. The program shown here reflects USN, USMC, USAF, and International Partner funding.

Funding at the accomplishment/planned program level is reported as the total of all services and partners as these activities support all aircraft variants.

The System Development and Demonstration (SDD) budget funds a total quantity of 20 RDT&E test articles to include 6 ground test articles and 14 flight test articles for USN, USMC, and USAF use.

- FY07: 1 F-35A flight test article
- FY08: 1 F-35B flight test article; 1 F-35B ground test article
- FY09: 1 F-35B flight test article; 2 F-35A ground test articles
- FY10: 6 flight test articles: 3 F-35A, 2 F-35B, 1 F-35C; 3 ground test articles: 1 F-35B, 2 F-35C
- FY11: 4 flight test articles: 1 F-35A, 1 F-35B, 2 F-35C
- FY13: 1 F-35C flight test article

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SDD because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy	Date: May 2021
---	-----------------------

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604800M / <i>Joint Strike Fighter (JSF) - EMD</i>
--	---

The remaining funds each year for the next several years we need to support contract closeout which generally includes invoicing reconciliation, unpaid fees LM has in Claims/REAs, etc which in the case of SDD could go well above the budget on the POM. Cuts or zeroing out the out years will only force the Services to pay the closeout costs.

B. Program Change Summary (\$ in Millions)	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>
Previous President's Budget	1.710	0.561	0.584	-	0.584
Current President's Budget	1.708	0.561	0.577	-	0.577
Total Adjustments	-0.002	0.000	-0.007	-	-0.007
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.002	0.000			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-0.007	-	-0.007

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604800M / Joint Strike Fighter (JSF) - EMD				Project (Number/Name) 2262 / Joint Strike Fighter EMD STOVL			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
2262: Joint Strike Fighter EMD STOVL	51,167.708	1.708	0.561	0.577	-	0.577	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 198

Note
Beginning in FY2022, the JSF EMD (Project Unit 2262) budget is service specific with the following services removed:
USAF PE 0604800F BPAC 653831
USN PE 0604800N Project Unit 2261

A. Mission Description and Budget Item Justification
The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the USN, USAF, USMC and allies. The three variants are the F-35A Conventional Takeoff and Landing; F-35B Short Takeoff and Vertical Landing; and the F-35C Aircraft Carrier suitable variant. The F-35A will be a stealthy multi-role aircraft, primary air-to-ground for the Air Force to replace the F-16 and A-10 and complement the F-22. The F-35B variant will be a multi-role strike fighter aircraft to replace the AV-8B and F/A-18 for the Marine Corps, replace the Sea Harrier and GR 7 for the United Kingdom, and replace the AV-8 currently employed by the Italian Navy. The F-35C will provide the Department of the Navy a multi-role, stealthy strike fighter aircraft to complement the F/A-18E/F.

The United Kingdom, Italy, Netherlands, Canada, Australia, Denmark, Norway, and Foreign Military Sales customers are also participants in the Joint Strike Fighter program. The program shown here reflects United States Navy (USN), United States Marine Corps, United States Air Force (USAF), and International Partner funding.

The top-line Program Element reflects the unique variant for each Service. Funding at the accomplishment/planned program level is reported as the total of all services and partners as these activities support all aircraft variants.

The System Development and Demonstration (SDD) budget funds a total quantity of 20 RDT&E test articles to include 6 ground test articles and 14 flight test articles for USN, USMC and USAF use.

FY07: 1 F-35A flight test article
FY08: 1 F-35B flight test article; 1 F-35B ground test article
FY09: 1 F-35B flight test article; 2 F-35A ground test articles
FY10: 6 flight test articles: 3 F-35A, 2 F-35B, 1 F-35C; 3 ground test articles: 1 F-35B, 2 F-35C
FY11: 4 flight test articles: 1 F-35A, 1 F-35B, 2 F-35C
FY13: 1 F-35C flight test article

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / Joint Strike Fighter (JSF) - EMD	Project (Number/Name) 2262 / Joint Strike Fighter EMD STOVL

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
<p>Title: System Development and Demonstration (SDD)</p> <p align="right">Articles:</p> <p>Description: SDD execution of the Air System (Lockheed Martin) including International Commonality Efforts; includes airframe, vehicle and mission systems, autonomic logistics, systems engineering & test efforts.</p> <p>FY 2021 Plans: Continue SDD execution of Air System (Lockheed Martin), including International Commonality Effort which includes, airframe, vehicle systems, mission systems, autonomic logistics, systems engineering, and integrated test efforts. Activity aligned to IMS in accordance with variant IOC. Continue to conduct SDD closure activities including FCA/PCA (Functional Configuration Audit/Production Configuration Audit) in order to establish production specification and transition to post-SDD, production and sustainment.</p> <p>FY 2022 Base Plans: Continue SDD execution of Air System (Lockheed Martin), including International Commonality Effort which includes, airframe, vehicle systems, mission systems, autonomic logistics, systems engineering, and integrated test efforts. Activity aligned to IMS in accordance with variant IOC. Continue to conduct SDD closure activities including FCA/PCA (Functional Configuration Audit/Production Configuration Audit) in order to establish production specification and transition to post-SDD, production and sustainment.</p> <p>FY 2022 OCO Plans: N/A</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY21 to FY22 increase of (\$0.016) is to compensate for normal inflation.</p>	1.708	0.561	0.577	0.000	0.577
Accomplishments/Planned Programs Subtotals	1.708	0.561	0.577	0.000	0.577

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• RDT&E/0604800F: F-35A Joint Strike Fighter SDD	7.628	5.423	0.013	-	0.013	-	-	-	-	-	-
• RDT&E/0604800N/2261: F-35C JT Strike Fighter (JSF) - EMD	1.481	0.250	0.262	-	0.262	-	-	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / Joint Strike Fighter (JSF) - EMD	Project (Number/Name) 2262 / Joint Strike Fighter EMD STOVL

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• APN/0605B: F-35B Joint Strike Fighter STOVL Spares	258.779	194.608	126.970	-	126.970	-	-	-	-	-	-
• APN/0605C: F-35C Joint Strike Fighter CV Spares	97.612	112.265	221.402	-	221.402	-	-	-	-	-	-
• APN/0592: F-35B STOVL Series	65.585	151.797	177.054	-	177.054	-	-	-	-	-	-
• APN/0593: F-35C CV Series	15.358	106.740	138.269	-	138.269	-	-	-	-	-	-
• APN/0147C: F-35C Joint Strike Fighter CV AP	339.053	326.147	249.145	-	249.145	-	-	-	-	-	-
• APN/0147: F-35C Joint Strike Fighter CV	2,321.012	3,055.327	2,388.849	-	2,388.849	-	-	-	-	-	-
• APN/0152C: F-35B Joint Strike Fighter STOVL AP	291.804	303.035	216.814	-	216.814	-	-	-	-	-	-
• APN/0152: F-35B Joint Strike Fighter STOVL	1,879.833	1,422.384	2,517.520	-	2,517.520	-	-	-	-	-	-
• C2D2 International: International Continuous Capability Development and Delivery	258.004	359.626	285.969	-	285.969	-	-	-	-	-	-
• RDT&E/0604840N/2936: F-35C C2D2	342.860	370.235	0.000	-	0.000	-	-	-	-	-	-
• RDT&E/0604840M/3410: F-35B C2D2	380.232	341.179	0.000	-	0.000	-	-	-	-	-	-
• 0604840F F-35A C2D2: USAF Continuous Capability Development and Delivery	642.371	785.336	549.279	-	549.279	-	-	-	-	-	-

Remarks

This is a joint program with no executive service. Service Acquisition Execution (SAE) authority alternates between the Department of the Navy and the Department of the Air Force and currently resides with the Navy.

Program Element 0604800N/0604800M continues USN development efforts budgeted in 0603800N prior to 2002.

The United Kingdom, Italy, Netherlands, Canada, Australia, Denmark, and Norway are participants in the SDD phase of JSF.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / Joint Strike Fighter (JSF) - EMD	Project (Number/Name) 2262 / Joint Strike Fighter EMD STOVL

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u> <u>Base</u>	<u>FY 2022</u> <u>OCO</u>	<u>FY 2022</u> <u>Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
------------------	----------------	----------------	-------------------------------	------------------------------	--------------------------------	----------------	----------------	----------------	----------------	-----------------------------------	-------------------

Note: The USAF/USN/USMC procurement lines include Aircraft Procurement and Advanced Procurement only. Initial Spares and Repair Parts for all services are reflected in separate lines. International Partner Funding also includes funds provided under the Italy and Netherlands Bilateral agreements.

RELATED RDT&E: Funding prior to JSF SDD (FY94-FY01): USN PE 0603800N \$1,950.617M; USAF PE 0603800F \$1,907.352M; DARPA PE 0603800E \$118.056M; and International Partner contributions of \$253.921M for a total of \$4,229.946M.

D. Acquisition Strategy

The SDD program consists of a cost-reimbursement contract awarded to Lockheed Martin Aeronautics Company to develop the F-35 Air System, consisting of three aircraft variants and its associated logistics support system, for the U.S. Services and international participants. Similarly, a cost-reimbursement contract was awarded to Pratt & Whitney to develop the F135 propulsion system. Ground and flight testing will be conducted during development to accomplish validation and verification, with the extensive use of modeling and simulation to offset the risk of this large, complex, and concurrent lifecycle program. A comprehensive logistics support environment, including an integrated training system for aircrew, maintenance, and support personnel, is also being developed.

On 25 April 2011, the Department of Defense terminated the development of the General Electric Rolls-Royce Fighter Engine Team F136 propulsion system.

The F-35 Program has made international involvement a key element of the acquisition strategy. This includes international partnership in the development, production, and sustainment phases of the lifecycle. Additional international participation includes Foreign Military Sales arrangements.

In Fiscal Year 2007, separate cost-type contracts were awarded to Lockheed Martin Aeronautics Company and Pratt & Whitney to begin low rate initial production for F-35 air vehicles, propulsion systems, and sustainment for the fielded systems. Transition to fixed-price-type procurement contracts occurred with the fourth low rate lot. To provide logistics support for delivered aircraft, Performance-Based Logistics cost-type contracts will be awarded to Lockheed Martin Aeronautics Company and Pratt & Whitney.

At the completion of Low Rate Initial Production, a Defense Acquisition Board review, and Milestone Decision Authority approval, the F-35 Program will enter Full Rate Production. Fixed-price procurement contracts will be awarded for F-35 air vehicles and propulsion systems for the U.S. Services and international participants. Multiyear procurement authority for the F-35 Air System will be requested for Full Rate Production. Concurrently, a fixed-price-type Performance Based Logistics contracts for sustainment will be requested to support multi-Service and multi-national requirements.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / Joint Strike Fighter (JSF) - EMD	Project (Number/Name) 2262 / Joint Strike Fighter EMD STOVL
--	--	---

Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Primary Hardware Development - SDD	C/CPIF	Lockheed Martin : Ft. Worth, TX	32,473.044	1.708	Dec 2019	0.561	Dec 2020	0.577	Dec 2021	-		0.577	-	-	-
Prior Year No Longer Funded in FYDP	Various	Various : Various	13,965.497	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			46,438.541	1.708		0.561		0.577		-		0.577	-	-	N/A

Remarks
 Contract type prior to 2013 was CPAF.
 Cumulative Award Fee earned in prior years for Lockheed Martin is 97%.
 Cumulative Award earned in prior years for Pratt and Whitney is 98%.

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prior Year No Longer Funded in FYDP	Various	Various : Various	1,394.817	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			1,394.817	0.000		0.000		0.000		-		0.000	-	-	N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Prior Year No Longer Funded in FYDP	Various	Various : Various	2,420.240	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			2,420.240	0.000		0.000		0.000		-		0.000	-	-	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy												Date: May 2021			
Appropriation/Budget Activity 1319 / 5				R-1 Program Element (Number/Name) PE 0604800M / Joint Strike Fighter (JSF) - EMD				Project (Number/Name) 2262 / Joint Strike Fighter EMD STOVL							
Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year No Longer Funded in FYDP	Various	Various : Various	914.110	0.000		0.000		0.000		-		0.000	-	-	-
Subtotal			914.110	0.000		0.000		0.000		-		0.000	-	-	N/A
			Prior Years	FY 2020	FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			51,167.708	1.708		0.561		0.577		-		0.577	-	-	N/A

Remarks
Subtotals and totals may not add due to rounding.

JSF EMD Includes:
USAF PE 0604800F BPAC 653831
USN PE 0604800N Project Unit 2261
USMC PE 0604800M Project Unit 2262

D&S Includes:
USAF PE 0604800F BPAC 653832
USN PE 0604800N Project Unit 3352
USMC PE 0604800M Project Unit 3350

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / Joint Strike Fighter (JSF) - EMD	Project (Number/Name) 2262 / Joint Strike Fighter EMD STOVL
--	--	---

JSF Variants - CV, STOVL & CTOL	FY 2020				FY 2021				FY 2022			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Acquisition Milestones		F-35C IOC ▲										
Test & Evaluation	Initial Operational Test and Evaluation (IOT&E)											
Defense Acquisition Reviews	IPR ■				IPR ■				IPR ■			
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft)	LOT 13 (CTOL 56, CV 15, STOVL 22) ●	LOT 14 (CTOL 62, CV 20, STOVL 14) ●				LOT 15 (CTOL 60, CV 26, STOVL 10) ●				LOT 16 (CTOL 48, CV 15, STOVL 17) ●		

2022PB - 0604800M - 2262

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / <i>Joint Strike Fighter (JSF) - EMD</i>	Project (Number/Name) 2262 / <i>Joint Strike Fighter EMD STOVL</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>JSF Variants - CV, STOVL & CTOL</i>				
Acquisition Milestones: F-35C Initial Operational Capability	2	2020	2	2020
Test & Evaluation: Test and Evaluation: Initial Operational Test and Evaluation (IOT&E)	1	2020	2	2021
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-19	1	2020	1	2020
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-20	1	2021	1	2021
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-21	1	2022	1	2022
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LOT 13 Full Funding / Production / Delivery	1	2020	1	2020
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LOT 14 Full Funding / Production / Delivery	2	2020	2	2020
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LOT 15 Full Funding / Production / Delivery	2	2021	2	2021
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LOT 16 Full Funding / Production / Delivery	2	2022	2	2022