Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force											Date: May 2021	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0207134F / *F-15E Squadrons*							
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	0.000	640.124	288.381	239.616	0.000	239.616	-	-	-	-	-	-
670131: *F-15 Advanced Development*	0.000	53.400	0.000	0.000	0.000	0.000	-	-	-	-	-	-
676020: *F-15 Modernization*	0.000	586.724	288.381	239.616	0.000	239.616	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The F-15 is the most versatile fighter in the world today. The F-15C/D continues to provide air superiority with an undefeated and unmatched aerial combat record. The F-15E retains this air superiority capability and adds systems, such as advanced imaging and targeting systems, to meet the requirement for all-weather, deep-penetration, and night/under-the-weather, air-to-surface attack. Configured with conformal fuel tanks (CFTs), the F-15E deploys worldwide with minimal tanker support and arrives combat-ready. A mainstay in operations both domestic and abroad, a refresh of older F-15C/D aircraft with the F-15EX and upgrades to newer F-15C/D aircraft and F-15E aircraft (avionics, armament, airframe, and engines) are critical to maintaining combat viability (lethality, survivability, and supportability) in support of the 2018 National Defense Strategy. With the F-15E projected to remain in service past 2040, avionics modernization is key to long-term weapon system viability. This modernization is built on a foundation of technical and acquisition support studies (both internal to the Air Force and through outside contractors), forestalling obsolescence, exploiting proven technological advances, and leveraging new technology. Major avionics upgrades center around radar modernization (both hardware and software upgrades) and the exploitation of enhanced capability via precision timing, data delivery and processing technology, precision registration systems, cockpit Heads Up Display (HUD) and Heads Down Display, instrumentation digitization and modernization, central computer processing power increases, digital mission event recording systems and an infrared (IR)-based fire control system. The proliferation of fourth-generation enemy aircraft and sophisticated "double-digit" anti-aircraft missile systems pose a significant threat to F-15 survivability. A fully integrated electronic warfare suite holds the promise of providing survivability as well as expanded electronic attack capability. Nearly all improvements are linked to an aircraft operational flight program update schedule that works to integrate new capabilities with the airframe. These updates are a responsive way to increase the offensive and defensive capability and survivability of the F-15. Incorporation of corresponding spiral and/or phased technology/equipment improvements that include support equipment, mission planning systems, and training device upgrades will improve performance, supportability, and aircrew training. Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion, and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness. This includes technical and acquisition-related studies to ensure F-15E lethality and survivability beyond 2040.

The total F-15EX RDT&E funding for FY20 in the amount of $404.996M resides in Program 0207134F Project 670131 ($53.400M) and Project 676020 ($351.596M). FY21 and beyond RDT&E funding resides in Program 0207146F.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY20 $6.031M was expended for civilian pay expenses in this program element, and in FY21 $4.020M is forecasted for civilian pay expenses in this program element.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force	Date: May 2021
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	684.229	298.908	243.462	0.000	243.462
Current President's Budget	640.124	288.381	239.616	0.000	239.616
Total Adjustments	-44.105	-10.527	-3.846	0.000	-3.846
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-10.527			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-21.000	0.000			
• SBIR/STTR Transfer	-23.105	0.000			
• Other Adjustments	0.000	0.000	-3.846	0.000	-3.846

Change Summary Explanation

FY20 Congressional Directed Reduction to Mobile User Objective System (MUOS) for unjustified growth. FY20 Congressional Directed Transfer to F-15EX from APAF for two test aircraft and non-recurring engineering. FY21 change due to F-15E Re-phase of -$41.200M; an increase of $9.902M for F-15E Large Area Display; -$51.426 reduction to account for the availability of prior year execution balances; and Inflation Rate adjustment of -$0.572.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / *F-15E Squadrons*	Project (Number/Name) 670131 / *F-15 Advanced Development*	

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
670131: *F-15 Advanced Development*	0.000	53.400	0.000	0.000	0.000	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

A refresh of the F-15C/D fleet is critical to maintaining combat viability (lethality, survivability, and supportability) in support of the 2018 National Defense Strategy. Older F-15C/D aircraft will be replaced to maintain a viable mix of 4th and 5th-generation fighters for the next 20+ years. The F-15EX will be based on the 2-seat F-15QA (Qatar) configuration upgraded with USAF only capabilities, including the Eagle Passive Active Warning and Survivability System (EPAWSS) and the Suite 9.1 Operational Flight Program (OFP) software. With two seats, it will be multi-role-capable and operable by one or two aircrew. Many F-15C/Ds are beyond their service life and have SERIOUS structural risks, wire chafing issues, and obsolete parts. Readiness goals are unachievable due to continuous structural inspections, time consuming repairs, and on-going modernization efforts. The average F-15C/D is 36 years old with over 8,400 flight hours; the oldest F-15C was delivered in 1979. Logistics, maintenance, and training activities will heavily leverage the existing F-15 infrastructure.

Funds may be used to manufacture aircraft, support equipment, and initial spares to support test activities; integrate hardware and software subsystems; upgrade training systems and systems integration labs; develop training materials and technical manuals; pursue other non-recurring engineering activities to reduce integration and cybersecurity risks, ramp up the production line capacity, prepare for and conduct ground and flight testing, and pursue technology insertion opportunities; resolve Diminishing Manufacturing Sources/Material Shortages (DMSMS) and/or obsolescence issues; fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness; and cover other related requirements to manufacture and sustain the test aircraft.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY20 $6.031M was expended for civilian pay expenses in this program element, and in FY21 $4.020M is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: F-15EX	53.400	0.000	0.000
Description: Additional F-15EX RDT&E FY20 funding in the amount of $351.596M resides in Program 0207134F Project 676020. F-15EX will refresh the F-15C/D fleet with new aircraft based on the F-15QA Foreign Military Sales (FMS) configuration being sold to Qatar. The program will also incorporate USAF-only capabilities, including the Eagle Passive Active Warning and Survivability System (EPAWSS) and the Suite 9.1 Operational Flight Program (OFP) software.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 670131 / *F-15 Advanced Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: FY21 funding resides in PE 027146F BPAC 670131. ***FY 2022 Plans:*** FY22 funding resides in PE 027146F BPAC 670131.			
Accomplishments/Planned Programs Subtotals	53.400	0.000	0.000

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
• APAF 01 F015E0: *F-15EX*	621.100	-	-	-	-	-	-	-	-	-	-
• APAF 05 F015EX: *F-15EX*	-	1,403.347	1,250.436	-	1,250.436	-	-	-	-	-	-
• RDTE 07 0207146F: *F-15EX*	-	159.761	119.239	-	119.239	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The F-15EX design will be based on the F-15QA (Qatar) configuration upgraded with USAF-only capabilities like the Eagle Passive Active Warning and Survivability System (EPAWSS) and the Suite 9.1 Operational Flight Program (OFP) software. Since most subsystems are projected to be mature when required for integration into the F-15EX, the acquisition strategy is deemed low risk. To rapidly field the F-15EX, the USAF plans to focus engineering activities on integrating existing systems and ramping up the production line capacity. Test activities will likewise be tailored to focus on integration of F-15QA, EPAWSS, and the Suite 9.1 OFP, taking appropriate credit for previous USAF and FMS testing. Finally, logistics, maintenance, and training activities will heavily leverage existing the F-15 infrastructure.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / *F-15E Squadrons*	Project (Number/Name) 670131 / *F-15 Advanced Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
F-15EX	Various	Various : Various	0.000	43.700	Jul 2020	-		-		-		-	-	-	-
		Subtotal	0.000	43.700		-		-		-		-	-	-	N/A

Remarks

The individual program reference to "various" contract methods addresses other government costs for trainers, test, hardware, special studies, telemetry kits, etc. that are required to meet each program's objectives. The execution vehicles between these DoD entities vary by effort.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Flight Test	Various	Eglin : Various	0.000	1.500	Apr 2020	-		-		-		-	-	-	-
		Subtotal	0.000	1.500		-		-		-		-	-	-	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AFLCMC CIV Pay	Various	AFLCMC CIV PAY : WPAFB & Robins AFBs	0.000	6.600	Oct 2019	-		-		-		-	-	-	-
Program Management Administration	Various	Various : Various	0.000	1.600	Oct 2019	-		-		-		-	-	-	-
		Subtotal	0.000	8.200		-		-		-		-	-	-	N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	53.400		0.000		-		-		-	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 670131 / *F-15 Advanced Development*

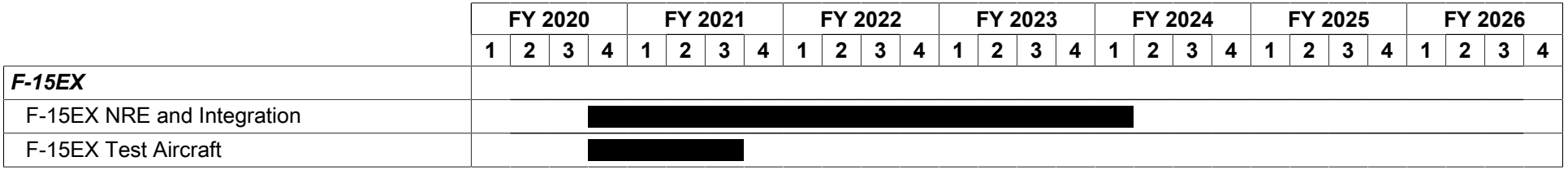

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 670131 / *F-15 Advanced Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F-15EX				
F-15EX NRE and Integration	4	2020	1	2024
F-15EX Test Aircraft	4	2020	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / *F-15E Squadrons*	Project (Number/Name) 676020 / *F-15 Modernization*	

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
676020: *F-15 Modernization*	0.000	586.724	288.381	239.616	0.000	239.616	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Due to congressional language, two (2) F-15EX aircraft were moved from Procurement to RDT&E.

A. Mission Description and Budget Item Justification

These development efforts include F-15 Radar Enhancements Electronic Protection (EP) capabilities, Operational Flight Program (OFP) upgrades, Flight Testing, Infrared Search and Track (IRST), Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS) and Mobile User Objective System (MUOS)/Second Generation Anti-jam Tactical UHF Radio for NATO (SATURN). Funds may be used to resolve emerging safety of flight and diminishing manufacturing sources issues, accommodate technology insertion and fulfill FAA or other mandates necessary to ensure continued aircrew safety and mission effectiveness.

The Radar Enhancements (EP) will upgrade the digital Active Electronic Scanned Array (AESA) radar capabilities to counter sophisticated electronic threats. Prior OFP's introduced EP into the C/D-model fleet. Initial EP capability for APG-82(V)1 equipped E model aircraft took place in Suite 8E. Suite 9 and beyond will add additional EP capability to both the F-15E and F-15C.

For the F-15 to maintain operational effectiveness, the program must continuously provide the platforms with improved capabilities. To accomplish this there is an on-going need to develop software and hardware upgrades and to flight test new capabilities and systems. The OFP funding line is transiting the Air Force to an annual software release to counter the speed of technology and maintain a competitive advantage. Additionally, the OFP provides the path for integration for other activities into operations. At any one time, there will normally be three OFP upgrades in work: one in requirements definition/pricing, one in code writing and test, and one in flight test and release preparation. The Flight Test funding line allows the Air Force to fund the on-going test effort.

Infrared Search and Track (IRST) system will provide air to air detection, tracking and ranging capability for F-15C/D in a radar-contested environment.

Mobile User Objective System (MUOS)/Second Generation Anti-jam Tactical UHF Radio for NATO (SATURN) will provide Satellite Communications (SATCOM) capable Air Force F-15C/D/E aircraft the ability to communicate on the Mobile User Objective System (MUOS) constellation in support of a NORTHCOM Airspace Control Alert (ACA) requirement. SATURN will replace the Have Quick II and comply with the NSA lease key mandated dates.

Automatic Dependent Surveillance-Broadcast (ADS-B) provides Air Traffic Control position and other secondary surveillance data and must be installed on all CONUS aircraft by 2020 IAW FAA mandate.

The Data Transfer Module II (DTM II) is an upgraded replacement to the current, low-memory data transfer system. Improves and supports mission planning capability and weapons employment, increases storage, replaces aging mapping system, updates interfaces, provides data encryption and delivers cyber security.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

Modern high resolution Digital Color Displays will replace the current antiquated monochrome displays. These upgraded displays enable accurate distinction and identification of targets, decrease risk of frat/missed targeting, and enable full utilization of radar capability that significantly enhances situational awareness.

ALQ-128a will replace the legacy ALQ-128 design and includes development and integration of a re-designed ALQ-128a Electronic Warfare Warning Set (EWWS).

A refresh of the F-15C/D fleet is critical to maintaining combat viability (lethality, survivability, and supportability) in support of the 2018 National Defense Strategy. Older F-15C/D aircraft will be replaced to maintain a viable mix of 4th and 5th generation fighters for the next 20+ years. The F-15EX will be based on the 2-seat F-15QA (Qatar) configuration upgraded with USAF only capabilities, including the Eagle Passive Active Warning and Survivability System (EPAWSS) and the Suite 9.1 Operational Flight Program (OFP) software. With two seats, it will be multirole-capable and operable by one or two aircrew. Many F-15C/Ds are beyond their service life and have SERIOUS structural risks, wire chafing issues, and obsolete parts. Readiness goals are unachievable due to continuous structural inspections, time consuming repairs, and on-going modernization efforts. The average F-15C/D is 36 years old with over 8,400 flight hours; the oldest F-15C was delivered in 1979. Logistics, maintenance, and training activities will heavily leverage existing the F-15 infrastructure. Funding supports procurement of two (2) F-15EX aircraft and associated support equipment, training system upgrades and materials, depot stand-up planning, initial spares, and other related items to manufacture the aircraft, provide operational conversion (from F-15C/D to F-15EX) support, and meet logistics and sustainment requirements.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. In FY20 $6.031M was expended for civilian pay expenses in this program element, and in FY21 $4.020M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Operational Flight Program (OFP) Development Efforts	70.476	88.655	96.888
Description: Provides OFP program software and hardware updates to integrate new capabilities on all F-15 aircraft. This includes technical and acquisition related studies.			
FY 2021 Plans: Continue Suite development and integration of major line items, such as Data Transfer Module (DTM) II, Passive Attack Display (PAD), Eagle Passive/Active Warning Survivability System (EPAWSS), Multi-functional Information Distribution System (MIDS) - Joint Tactical Radio System (JTRS) MIDS-JTRS, implementing B61-12LEP (Life Extension Program, F-15 EX, IRST (Infrared Search and track); all on the new Advanced Display Core Processor (ADCP) II mission computer. Continuation of radar updates being delivered along with continuation of organic software support and Special Projects development efforts. Continuation of funding support for all F-15 trainers and ongoing Problem Report (PR) and Deficiency Report (DR) fixes. Continue work on Future OFP's and award the Continuous Development & Integration (CD&I) contract to take advantage of industries cutting edge knowledge and providing greater flexibility and resilience to the F-15. Perform technical and acquisition related studies to ensure F-15 lethality and survivability beyond 2040. Continue integration efforts to ensure system wide acceptance of new hardware/ software and desired capabilities. Continue to support Program Management Activities in support of the OFP's and the F-15.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continue Suite development and integration of major line items, such as Data Transfer Module (DTM) II, Passive Attack Display (PAD), Eagle Passive/Active Warning Survivability System (EPAWSS), Multi-functional Information Distribution System (MIDS) - Joint Tactical Radio System (JTRS) MIDS-JTRS, implementing B61-12LEP (Life Extension Program, F-15 EX, IRST (Infrared Search and track); all on the new Advanced Display Core Processor (ADCP) II mission computer. Continuation of radar updates being delivered along with continuation of organic software support and Special Projects development efforts. Continuation of funding support for all F-15 trainers and ongoing Problem Report (PR) and Deficiency Report (DR) fixes. Continue work on Future OFP's and award the Continuous Development & Integration (CD&I) contract to take advantage of industries cutting edge knowledge and providing greater flexibility and resilience to the F-15. Perform technical and acquisition related studies to ensure F-15 lethality and survivability beyond 2040. Continue integration efforts to ensure system wide acceptance of new hardware/ software and desired capabilities. Continue to support Program Management Activities in support of the OFP's and the F-15. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Continue integration of the Infrared Search and Track (IRST) system into existing 7.2 OFP and future 9.2 OFP planning, EMD asset building and qualification, integration testing and flight test, and delivering initial low-rate production (LRIP). Continue integration of IRST with other F-15 advanced sensors. Continue efforts and planning to integrate future IRST capability into the next major block upgrade to ensure system wide acceptance of new hardware/software and desired capabilities.			
Title: Flight Test	15.735	27.505	27.763
Description: Flight test improvements. Baselined infrastructure and personnel support for F-15 Developmental Test (DT) and Operational Test (OT) operations. Purchased long-lead test support assets and unique aircraft test instrumentation. This included technical and acquisition related studies. ***FY 2021 Plans:*** F-15 Flight Test Support continues to provide contractor support cadre at Eglin and Nellis for DT/OT support, avionics integration, lab O&M, CTF O&M, and long-lead test unique equipment; i.e., program specific aircraft instrumentation, weapons instrumentation kits, data reduction/handling equipment. Repair test aircraft radar instrumentation. Continues design of replacement radar test aircraft obsolete instrumentation. Continue Richter Lab modernization and sustainment provisions, and acquisition of resources needed to maintain a robust test capability for the entire F-15 fleet going forward. Continue support to 896 TSS with additional manpower, to include prefabrication and surge capability, during increased F-15 modernization activity. ***FY 2022 Plans:*** F-15 Flight Test Support continues to provide contractor support cadre at Eglin and Nellis for DT/OT support, avionics integration, lab O&M, CTF O&M, and long-lead test unique equipment; i.e., program specific aircraft instrumentation, weapons instrumentation kits, data reduction/handling equipment. Repair test aircraft radar instrumentation. Continues design of replacement radar test aircraft obsolete instrumentation. Continue Richter Lab modernization and sustainment provisions, and acquisition of resources			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
needed to maintain a robust test capability for the entire F-15 fleet going forward. Continue support to 896 TSS with additional manpower, to include prefabrication and surge capability, during increased F-15 modernization activity. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase driven by additional Flight Test efforts.			
Title: F-15 Radar Enhancements ***Description:*** Improvements to F-15 Radar Enhancements (EP). This includes technical and acquisition related studies. ***FY 2021 Plans:*** Continue implementation of EP/EW into OFP's. Continue Special Projects testing support. Continue EP/EW and Combat ID candidate risk reduction for future OFP integration. Continue to study and analyze F-15 radar performance and utilization against current and future threat baselines. Continue to develop and test radar technology candidates for future integration in accordance with ACC's F-15 roadmap and threat analysis. This includes technical and acquisition-related studies as well as EP/EW candidates (e.g. ALQ-128). Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2022 Plans:*** Continue implementation of EP/EW into OFP's. Continue Special Projects testing support. Continue EP/EW and Combat ID candidate risk reduction for future OFP integration. Continue to study and analyze F-15 radar performance and utilization against current and future threat baselines. Continue to develop and test radar technology candidates for future integration in accordance with ACC's F-15 roadmap and threat analysis. This includes technical and acquisition-related studies as well as EP/EW candidates (e.g. ALQ-128). Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase primarily driven by S9.2 efforts	73.874	69.728	72.291
Title: F-15 Infrared Search and Track (IRST) ***Description:*** The Infrared Search and Track (IRST) system provides F-15C/D/E/EX's with the capability to detect and track objects by infrared radiation. This capability complements the radar to enhance survivability and lethality against air-to-air threats, air-to-ground targeting, provides a passive infrared sensor system that searches for and detects infrared radiation, and provides the aircraft mission computer track file data on infrared targets. The IRST system further adds capability for the F-15 as a 4th generation fighter by supporting 5th/6th generation fighters to increase their lethality and survivability. ***FY 2021 Plans:***	22.614	22.735	22.323

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continue integration of the Infrared Search and Track (IRST) system into the existing 7.2 OFP and future 9.2 OFP planning, EMD asset building and qualification, integration testing and flight test, and delivering low-rate initial production (LRIP). Continue integration of IRST with other F-15 advanced sensors. Continue efforts and planning to integrate future IRST capability into the next major block upgrade to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2022 Plans:*** Continue integration of the Infrared Search and Track (IRST) system into the existing 7.2 OFP and future 9.2 OFP planning, EMD asset building and qualification, integration testing and flight test, and delivering low-rate initial production (LRIP). Continue integration of IRST with other F-15 advanced sensors. Continue efforts and planning to integrate future IRST capability into the next major block upgrade to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** No significant increase or decrease			
Title: Mobile User Objective System (MUOS)/Second Generation Anti-jam Tactical UHF Radio for NATO(SATURN) ***Description:*** Description: To enable F-15C/D/E's with MUOS/SATURN capability to replace the current UHF Follow-On (UFP) satellite system, the Have Quick II, and comply with the NSA Lease Key mandate dates. ***FY 2021 Plans:*** Continue with the integration into the OFP's. Purchase of any additional test assets not yet acquired. Begin and/or continue all required testing. Begin and/or continue the development of all kitting. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. Begin/continue flight testing as necessary. ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease due to the completion of RDTE efforts in FY21	42.394	54.127	0.000
Title: F-15 Multifunctional Information Distribution System - Joint Tactical Radio System (MIDS JTRS) ***Description:*** This upgrade integrates and installs a new Link 16 system on the F-15C & F-15E that complies with an NSA mandate on cryptographic modernization and an FAA mandate on frequency remapping. The FAA mandate requires all fielded Link-16 terminals incorporate the frequency re-mapping capability by 2025. ***FY 2021 Plans:***	6.382	1.550	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continue ESIL and Boeing flight test program.This includes technical and acquisition-related studies. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. Includes platform integration and test for new MIDS JTRS terminal block upgrade baseline, and incorporates Ethernet capability to enable advanced capabilities. . ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** No Funding after FY21 due to completion of RDT&E.			
Title: F-15 Digital Color Displays ***Description:*** Modern high resolution Digital Color Displays will replace the current antiquated monochrome displays. These upgraded displays enable accurate distinction and identification of targets, decrease risk of frat/missed targeting, and enable full utilization of radar capability that significantly enhances situational awareness. ***FY 2021 Plans:*** Continue activities for test facility LRUs, group A design, software updates, and purchasing long lead parts for test hardware. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2022 Plans:*** Continue group A design, software updates, and purchasing long lead parts for test hardware. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Slight decrease due to reduced on-going efforts	1.271	23.114	19.964
Title: F-15E Data Transfer Module II ***Description:*** The Data Transfer Module II (DTM II) is an upgraded replacement to the current, low-memory data transfer system. Improves and supports mission planning capability and weapons employment, increases storage, replaces aging mapping system, updates interfaces, provides data encryption and delivers cyber security. ***FY 2021 Plans:*** Installs on flight test aircraft and begin flight test. Integration with S9.2 continuing. Begin completion of system maturation efforts via a supplier support contract with each of the Group B OEMs. These contracts will provide the DTM II program with additional hardware units, MRA, LORA and FCA/PCA. ***FY 2022 Plans:***	2.382	0.967	0.387

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Integration with S9.2 continues. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase for additional S9.2 integration costs.			
Title: F-15EX ***Description:*** Additional F-15EX RDT&E FY20 funding in the amount of $53.400M resides in Program 0207134F Project 670131. F-15EX will procure two (2) test aircraft to support the refresh of the F-15C/D fleet with new aircraft based on the F-15QA Foreign Military Sales (FMS) configuration being sold to Qatar. The program will also incorporate USAF-only capabilities, including the Eagle Passive Active Warning and Survivability System (EPAWSS) and the Suite 9.1 Operational Flight Program (OFP) software. ***FY 2021 Plans:*** FY21 funding resides in PE 027146F BPAC 670131. ***FY 2022 Plans:*** FY22 funding resides in PE 027146F BPAC 670131. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** EX funding moved from PE 27134F to PE 27146F.	351.596	0.000	0.000
Accomplishments/Planned Programs Subtotals	586.724	288.381	239.616

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
• APAF 01 F015E0: *F-15EX*	621.100	-	-	-	-	-	-	-	-	-	-
• APAF 05 F015EX: *F-15EX*	-	1,403.347	1,346.022	-	1,346.022	-	-	-	-	-	-
• RDTE 07 0207146F: *F-15EX*	-	159.761	-	-	-	-	-	-	-	-	-
• APAF 05 Line Item F01500: *F-15 Modification of In-Service Aircraft, PEs 0207130, 0207134, 0207445, 0809731*	311.873	516.771	199.348	-	199.348	-	-	-	-	-	-
• APAF 06 Line Item 000999: *Initial Spares/Repair Parts (BP16)*	34.718	39.173	12.048	-	12.048	-	-	-	-	-	-
• APAF 07 Line Item F0150P: *F-15 Post Production Support*	43.356	101.711	54.283	-	54.283	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

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
• APAF 07 PE 0207040F: *Multi-Platform Electronic Warfare Equipment BPAC 190000*	-	-	-	-	-	-	-	-	-		

Remarks

ALQ-128a is an FY2019 Congressional Add.

D. Acquisition Strategy

The F-15EX design will be based on the F-15QA (Qatar) configuration upgraded with USAF-only capabilities like the Eagle Passive Active Warning and Survivability System (EPAWSS) and the Suite 9.1 Operational Flight Program (OFP) software. Since most subsystems are projected to be mature when required for integration into the F-15EX, the acquisition strategy is deemed low risk. To rapidly field the F-15EX, the USAF plans to focus engineering activities on integrating existing systems and ramping up the production line capacity. Test activities will likewise be tailored to focus on integration of F-15QA, EPAWSS, and the Suite 9.1 OFP, taking appropriate credit for previous USAF and FMS testing. Finally, logistics, maintenance, and training activities will heavily leverage existing the F-15 infrastructure.

Program is a continuation of effort which includes the development of all F-15 models. Funds are executed organically in support of equipment improvement, study, analysis, and test. Acquisition and management strategies for each program are independently developed and use a variety of contract methods and types to accomplish program objectives.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
F-15EX	Various	Various : Various	0.000	351.596	Jul 2020	-		-		-		-	-	-	-
Product Development	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	-	-	-
OFP Suite 8/9/CD&I Development and Test	SS/ Various	Boeing : St. Louis, MO	0.000	70.476	Mar 2020	81.060	Jun 2021	96.888	Jun 2022	-		96.888	-	-	-
F-15 Radar Enhancement	SS/ Various	Boeing : St Louis, MO	0.000	70.124	Aug 2020	69.728	Aug 2021	72.291	Aug 2022	-		72.291	-	-	-
F-15 Infrared Search and Track	SS/ Various	Boeing : St Louis, MO	0.000	22.614	Feb 2020	22.735	Feb 2021	22.323	Feb 2022	-		22.323	-	-	-
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS)	SS/ Various	Boeing : St. Louis, MO	0.000	6.382	Feb 2020	1.550	Feb 2021	-		-		-	-	-	-
Service Life Extension Program (SLEP) Wing Replacement	TBD	Not specified. : NV	0.000	-		-		-		-		-	-	-	-
Cabin Pressure Indicator	TBD	TBD : Various	0.000	-		-		-		-		-	-	-	-
Mobile User Objective System (MUOS) /Second Generation Anti-jam Tactical UHF Radio for NATO (SATURN)	C/CPAF	Boeing : St. Louis	0.000	42.394	Oct 2020	54.127	Oct 2021	-		-		-	-	-	-
F-15E Advanced Crew Station	TBD	TBD : TBD	0.000	1.271	Feb 2020	23.114	Oct 2020	19.964	Feb 2022	-		19.964	-	-	-
F-15E Data Transfer Module II	TBD	TBD : TBD	0.000	2.382	Jan 2021	0.967	Jan 2021	0.387	Jan 2022	-		0.387	-	-	-
ALQ-128a	TBD	TBD : TBD	0.000	-		-		-		-		-	-	-	-
JASSM ER	TBD	TBD : TBD	0.000	-		-		-		-		-	-	-	-
		Subtotal	0.000	567.239		253.281		211.853		-		211.853	-	-	N/A

Remarks

The individual program reference to "various" contract methods addresses other government costs for trainers, test, hardware, special studies, telemetry kits, etc. that are required to meet each program's objectives. The execution vehicles between these DoD entities vary by effort.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	-	-	-
Boeing (Contractor Test Support)	SS/CPFF	Boeing : St. Louis, MO	0.000	15.735	Aug 2020	27.505	Aug 2021	27.763	Aug 2022	-		27.763	-	-	-
		Subtotal	0.000	15.735		27.505		27.763		-		27.763	-	-	N/A

Remarks

The individual program reference to "various" contract methods addresses other government costs for trainers, test, hardware, special studies, telemetry kits, etc. that are required to meet each program's objectives. The execution vehicles between these DoD entities vary by effort.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	-	-	-
Program Mgt Support Costs	Various	Various : Various	0.000	3.750	Sep 2020	7.595	Sep 2021	-		-		-	-	-	-
		Subtotal	0.000	3.750		7.595		-		-		-	-	-	N/A

Remarks

The individual program reference to "various" contract methods addresses other government costs for trainers, test, hardware, special studies, telemetry kits, etc. that are required to meet each program's objectives. The execution vehicles between these DoD entities vary by effort.

	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	0.000	586.724		288.381		239.616		-		239.616	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15 Modernization*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F-15				
F-15EX NRE and Integration	4	2020	1	2024
OFP Continuous Development	3	2021	4	2026
OFP Integration and Test	3	2021	4	2026
OFP Suite 9 Fielding	4	2020	3	2021
OFP Suite 9.2 Fielding	4	2023	4	2024
OFP CD&I Development	3	2021	4	2026
OFP CD&I Release 1	3	2024	3	2025
OFP CD&I Release 2	3	2025	3	2026
OFP CD&I Release 3	3	2026	3	2026
Radar Enhancements Fielding (with OFP)	4	2020	3	2026
Infrared Search and Track Integration and Test	1	2020	4	2023
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS) Development	1	2020	2	2021
Mobile User Objective System (MUOS) Second Generation Anti-jam Tactical UUF Radio for NATO (SATURN) Study	1	2020	4	2021
Digital Color Display (formerly Advanced Crew Station)	2	2021	4	2025
Data Transfer Module II	2	2020	4	2022