Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force											Date: February 2020	
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 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	196.035	684.229	298.908	0.000	298.908	243.462	199.320	73.884	2.098	Continuing	Continuing
670131: *F-15 Advanced Development*	0.000	0.000	67.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	67.400
676020: *F-15*	0.000	196.035	616.829	298.908	0.000	298.908	243.462	199.320	73.884	2.098	Continuing	Continuing

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. 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-15 lethality and survivability beyond 2040.

The total F-15EX RTD&E funding for FY20 in the amount of $431.8M resides in Program 0207134F Project 670131 ($67.4M) and Project 676020 ($364.4M). FY21 RDT&E funding resides in Program 0207146F.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver F-15 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in Program 0605831F.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force	Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	203.183	336.079	382.204	0.000	382.204
Current President's Budget	196.035	684.229	298.908	0.000	298.908
Total Adjustments	-7.148	348.150	-83.296	0.000	-83.296
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-16.250			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	364.400			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-7.139	0.000			
• Other Adjustments	-0.009	0.000	-83.296	0.000	-83.296

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: 676020: *F-15*		
Congressional Add: *ALQ-128a*	48.243	0.000
Congressional Add Subtotals for Project: 676020	48.243	0.000
Congressional Add Totals for all Projects	48.243	0.000

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 2021 Air Force			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
670131: *F-15 Advanced Development*	0.000	0.000	67.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	67.400
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 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.

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 risks, ramp up the production line capacity, prepare for flight testing, and investigate 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 F-15 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2019 Air Force penalty total is $50.0M. The calculated percentage reduction to each research, development, test and evaluation, and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: F-15EX	-	67.400	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Additional F-15EX RDT&E FY20 funding in the amount of $364.4M 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. ***FY 2020 Plans:*** Manufacture two F-15EX aircraft, support equipment, and initial spares to support test activities. Initiate integration of USAF Suite 9.1 Operational Flight Program (OFP) into F-15QA avionics configuration plus the Eagle Passive Active Warning and Survivability System (EPAWSS). Upgrade training systems and systems integration labs; develop training materials and technical manuals; and pursue other non-recurring engineering activities to reduce integration risks, ramp up the production line capacity, prepare for flight testing, and investigate technology insertion opportunities. ***FY 2021 Base Plans:*** Continue OFP integration efforts, including merging F-15EX-unique software back into the common F-15 OFP in Suite 9.2. Continue upgrading training systems and systems integration labs; developing training materials and technical manuals; and pursuing other non-recurring engineering activities to reduce integration risks, ramp up the production line capacity, prepare for flight testing, and investigate technology insertion opportunities. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 funding is located in Program 0207146F Project 670131.					
Accomplishments/Planned Programs Subtotals	-	67.400	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APAF 01 F015E0: *F-15EX*	-	621.100	-	-	-	-	-	-	-	0.000	621.100
• APAF 01 F015EX: *F-15EX*	-	-	1,403.347	-	1,403.347	1,346.652	1,502.155	2,217.670	2,226.026	Continuing	Continuing
• RDTE 07 0207146F: *F-15EX*	-	-	159.761	-	159.761	-	-	-	-	0.000	159.761

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 670131 / *F-15 Advanced Development*

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 2021 Air Force		Date: February 2020
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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
F-15EX	Various	Various : Various	0.000	-		57.700	Jun 2020	-		-		-	0.000	57.700	-
		Subtotal	0.000	-		57.700		-		-		-	0.000	57.700	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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Flight Test	Various	Eglin : Various	0.000	-		1.500	Jun 2020	-		-		-	0.000	1.500	-
		Subtotal	0.000	-		1.500		-		-		-	0.000	1.500	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 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	-		-		-	0.000	6.600	-
Program Management Administration	Various	Various : Various	0.000	-		1.600	Oct 2019	-		-		-	0.000	1.600	-
		Subtotal	0.000	-		8.200		-		-		-	0.000	8.200	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		67.400		-		-		-	0.000	67.400	N/A

Remarks

Boeing may make pre-contract investments to further accelerate initial aircraft deliveries.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 670131 / *F-15 Advanced Development*

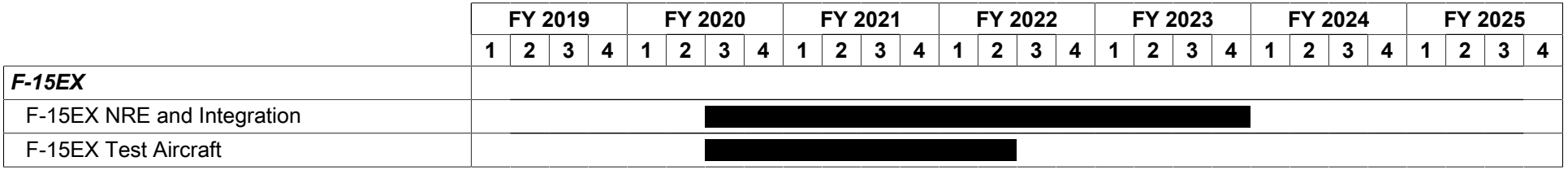

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 670131 / *F-15 Advanced Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F-15EX				
F-15EX NRE and Integration	3	2020	4	2023
F-15EX Test Aircraft	3	2020	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207134F / *F-15E Squadrons*	Project (Number/Name) 676020 / *F-15*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
676020: *F-15*	0.000	196.035	616.829	298.908	0.000	298.908	243.462	199.320	73.884	2.098	Continuing	Continuing
Quantity of RDT&E Articles	-	-	2	-	-	-	-	-	-	-		

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.

Data Transfer Module II (DTM II) is an upgraded replacement for the obsolete and outdated data transfer device currently in the F-15. DTM is 30 years old and out of storage capacity. DTM II will provide improved mission planning capability, updated interfaces, replace an aging map system, and meet growing security requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

Advanced Crew Station contains high resolution digital color large area displays; these 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 ALC-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 F-15 weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Operational Flight Program (OFP) Development Efforts	28.658	73.493	88.655	0.000	88.655
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 2020 Plans:*** Continue Suite 9 development and integration of major line items, such as Data Transfer Module (DTM) II, Advanced Crew Station (ACS), Passive Attack Display (PAD), Eagle Passive/Active Warning Survivability System (EPAWSS), Multi-functional Information Distribution System (MIDS) - Joint Tactical Radio System (JTRS) MIDS-JTRS, and implementing B61-12LEP (Life Extension Program); all on the new Advanced Display Core Processor (ADCP) II mission computer. Continuation of radar updates being delivered for the APG-63 and APG-82 radars, 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. Perform technical and acquisition related studies to ensure F-15					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
lethality and survivability beyond 2040. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2021 Base Plans:*** Continue Suite 9 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 for the APG-63 and APG-82 radars, 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 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increased because of a payback within the Air Force.					
Title: Flight Test ***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 2020 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	21.264	23.346	27.505	0.000	27.505

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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 Base 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 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increased due to 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 2020 Plans:*** Implement EP into OFP's. Conduct Special Projects testing support. Analyze EP and Combat ID candidate risk reduction for future OFP integration. Study and analyze F-15 radar performance and utilization against current and future threat baselines. 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. Integrate efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2021 Base Plans:*** Continue implementation of EP into OFP's. Continue Special Projects testing support. Continue EP 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.	45.831	69.523	69.728	0.000	69.728

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
This includes technical and acquisition-related studies. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding increase due to inflation					
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. This program element may include necessary civilian pay expenses required to manage, execute, and deliver IRST weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. ***FY 2020 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 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. ***FY 2021 Base Plans:*** Continue integration with Suite 9.2 ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:***	45.376	18.272	32.735	0.000	32.735

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Funding increased due to OFP 9.2 integration ramping up.					
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 2020 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 2021 Base 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 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decreased as program shifts to production.	0.000	52.750	54.127	0.000	54.127
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 2020 Plans:*** Continue ESIL and Boeing flight test program. This includes technical and acquisition-related studies, oversee ESIL & flight test program. Monitoring, testing and incorporation of OFP fixes. System Verification Reviews on C & E model aircraft. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2021 Base Plans:***	6.663	11.320	1.550	0.000	1.550

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Continue ESIL and Boeing flight test program. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Funding decreased due to ramping down on integration costs as the program moves into production.					
Title: F-15 Advanced Crew Station (ACS) ***Description:*** Advanced Crew Station (ACS) contains high resolution digital color large area displays; these 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. This program element may include necessary civilian pay expenses required to manage, execute, and deliver Color Displays weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. ***FY 2020 Plans:*** Cockpit optimization studies used by ACS, began in FY19 and should complete FY20. Begin initial EMD 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 2021 Base Plans:*** Continue EMD 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 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase in development, testing and design, as well as integration into OFPs.	0.000	1.275	23.641	0.000	23.641
Title: F-15E Data Transfer Module II	0.000	2.450	0.967	0.000	0.967

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Data Transfer Module II will replace current low-memory, obsolescent data transfer system with an updated data transfer device that improves mission planning capability, updates interfaces, provides data encryption, delivers significant additional storage, and increases cyber security capability. This program element may include necessary civilian pay expenses required to manage, execute, and deliver DTM II weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F. ***FY 2020 Plans:*** Procure flight test assets and initial group A kits. Begin software integration and testing to ensure system wide acceptance of new hardware/software and desired capabilities in both E and C model aircraft. ***FY 2021 Base Plans:*** Installs on flight test aircraft and begin flight test. Integration with S9.2 continuing. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease in funding due to development and testing ending.					
Title: F-15EX	-	364.400	0.000	0.000	0.000
Description: Additional F-15EX RDT&E FY20 funding in the amount of $67.4 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 2020 Plans:*** Manufacture two F-15EX aircraft, support equipment, and initial spares to support test activities. Initiate integration of USAF Suite 9.1 Operational Flight Program (OFP) into F-15QA avionics configuration plus the Eagle Passive Active Warning and Survivability System (EPAWSS). Upgrade training systems and systems integration labs; develop training materials and technical manuals; and pursue other non-recurring engineering					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
activities to reduce integration risks, ramp up the production line capacity, prepare for flight testing, and investigate technology insertion opportunities. ***FY 2021 Base Plans:*** Continue OFP integration efforts, including merging F-15EX-unique software back into the common F-15 OFP in Suite 9.2. Continue upgrading training systems and systems integration labs; developing training materials and technical manuals; and pursuing other non-recurring engineering activities to reduce integration risks, ramp up the production line capacity, prepare for flight testing, and investigate technology insertion opportunities. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY 2021 funding is located in Program 0207146F Project 670131.					
Accomplishments/Planned Programs Subtotals	147.792	616.829	298.908	0.000	298.908

	FY 2019	FY 2020
Congressional Add: ALQ-128a	48.243	0.000
FY 2019 Accomplishments: Program will replace the legacy ALQ-128 design which is no longer supportable, with a modern upgradeable architecture to provide automatic electronic warfare warning countermeasures and active jamming capability that can keep pace with modern threats. The design will incorporate a common architecture that can be integrated into multiple platforms including F-15C. Complete Engineering and Manufacturing Development (EMD) and Integration.		
FY 2020 Plans: N/A		
Congressional Adds Subtotals	48.243	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APAF 01 F015E0: *F-15EX*	-	621.100	-	-	-	-	-	-	-	0.000	621.100
• APAF 01 F015EX: *F-15EX*	-	-	1,403.347	-	1,403.347	1,346.652	1,502.155	2,217.670	2,226.026	Continuing	Continuing
• RDTE 07 0207146F: *F-15EX*	-	-	159.761	-	159.761	-	-	-	-	0.000	159.761

Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APAF 05 Line Item F01500: *F-15 Modification of In-Service Aircraft, PEs 0207130, 0207134, 0207445, 0809731*	338.622	311.873	516.771	-	516.771	199.348	216.004	206.004	-	Continuing	Continuing
• APAF 06 Line Item 000999: *Initial Spares/Repair Parts (BP16)*	7.718	34.718	39.173	-	39.173	12.048	12.624	20.401	-	Continuing	Continuing
• APAF 07 Line Item F0150P: *F-15 Post Production Support*	52.271	43.356	101.711	-	101.711	54.283	17.164	17.473	-	Continuing	Continuing
• APAF 07 PE 0207040F: *Multi-Platform Electronic Warfare Equipment BPAC 190000*	10.000	-	-	-	-	-	-	-	-	0.000	10.000

Remarks

ALQ-128a is a 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 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
F-15EX	Various	Various : Various	0.000	-		364.400	Jun 2020	-		-		-	0.000	364.400	-
Product Development	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
OFP Suite 8/9/CD&I Development and Test	SS/ Various	Boeing : St. Louis, MO	0.000	28.658	Aug 2019	69.743	Mar 2020	81.060	Jun 2021	-		81.060	Continuing	Continuing	-
F-15 Radar Enhancement	SS/ Various	Boeing : St Louis, MO	0.000	45.831	Aug 2019	69.523	Aug 2020	69.728	Aug 2021	-		69.728	Continuing	Continuing	-
F-15 Infrared Search and Track	SS/ Various	Boeing : St Louis, MO	0.000	45.376	Feb 2019	18.272	Feb 2020	32.735	Feb 2021	-		32.735	Continuing	Continuing	-
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS)	SS/ Various	Boeing : St. Louis, MO	0.000	6.663	Feb 2019	11.320	Feb 2020	1.550	Feb 2021	-		1.550	Continuing	Continuing	-
Service Life Extension Program (SLEP) Wing Replacement	TBD	Not specified. : NV	0.000	-		-		-		-		-	0.000	0.000	-
Cabin Pressure Indicator	TBD	TBD : Various	0.000	-		-		-		-		-	0.000	0.000	-
Mobile User Objective System (MUOS) /Second Generation Anti-jam Tactical UHF Radio for NATO (SATURN)	C/CPAF	Boeing : St. Louis	0.000	0.000	Mar 2019	52.750	Jan 2020	54.127	Jan 2021	-		54.127	Continuing	Continuing	-
F-15E Advanced Crew Station	TBD	TBD : TBD	0.000	-		1.275	Oct 2019	23.641	Oct 2020	-		23.641	Continuing	Continuing	-
F-15E Data Transfer Module II	TBD	TBD : TBD	0.000	-		2.450	Jan 2021	0.967	Jan 2022	-		0.967	Continuing	Continuing	-
ALQ-128a	TBD	TBD : TBD	0.000	45.176		-		-		-		-	0.000	45.176	-
		Subtotal	0.000	171.704		589.733		263.808		-		263.808	Continuing	Continuing	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 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Boeing (Contractor Test Support)	SS/CPFF	Boeing : St. Louis, MO	0.000	21.264	Aug 2019	23.346	Aug 2020	27.505	Aug 2021	-		27.505	Continuing	Continuing	-
		Subtotal	0.000	21.264		23.346		27.505		-		27.505	Continuing	Continuing	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 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Program Mgt Support Costs	Various	Various : Various	0.000	3.067	Sep 2019	3.750	Sep 2020	7.595	Sep 2021	-		7.595	Continuing	Continuing	-
		Subtotal	0.000	3.067		3.750		7.595		-		7.595	Continuing	Continuing	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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	196.035		616.829		298.908		-		298.908	Continuing	Continuing	N/A

Remarks

Boeing may make pre-contract investments to further accelerate initial aircraft deliveries for F-15EX.

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

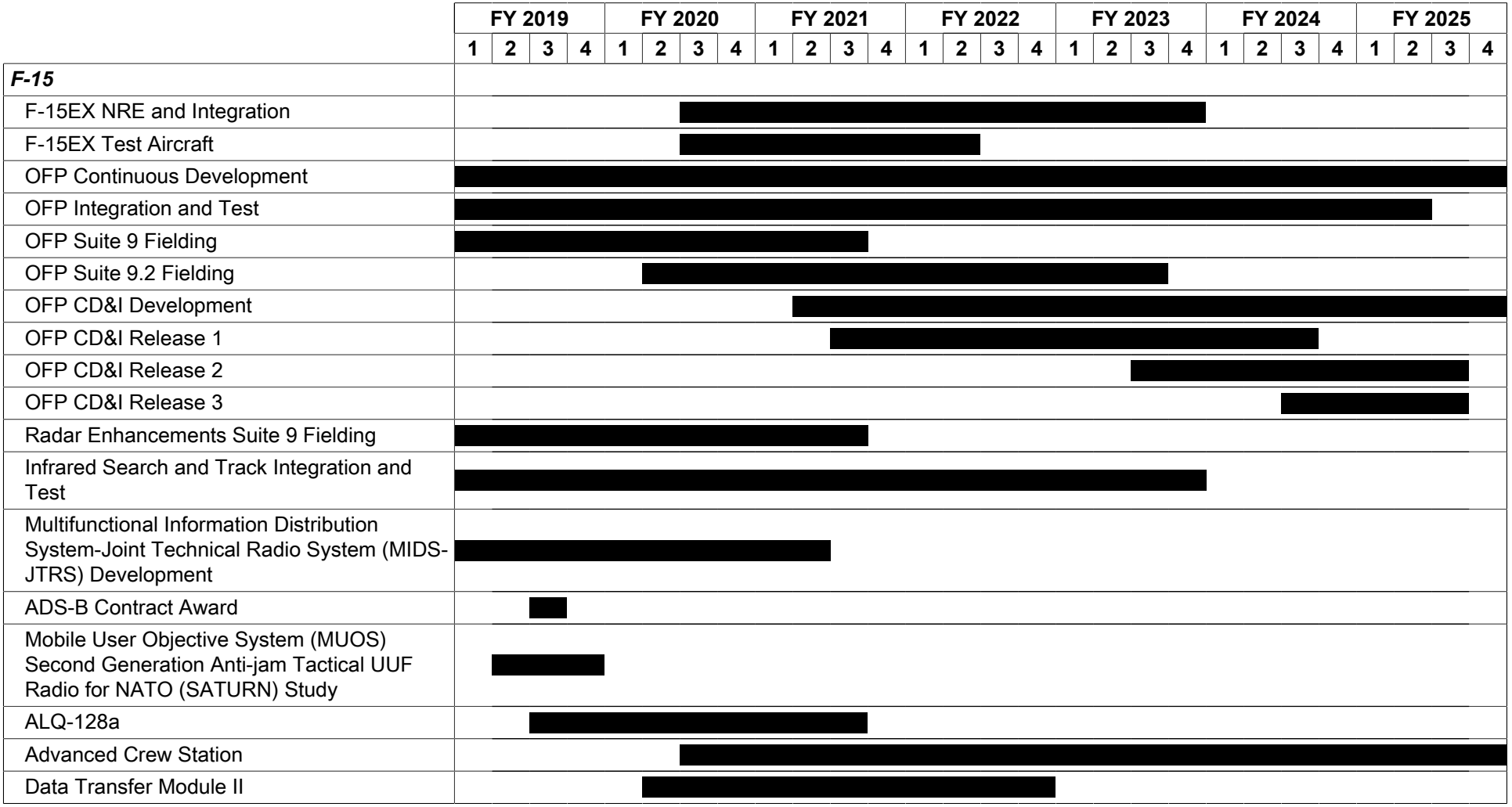

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F-15				
F-15EX NRE and Integration	3	2020	4	2023
F-15EX Test Aircraft	3	2020	2	2022
OFP Continuous Development	1	2019	4	2025
OFP Integration and Test	1	2019	2	2025
OFP Suite 9 Fielding	1	2019	3	2021
OFP Suite 9.2 Fielding	2	2020	3	2023
OFP CD&I Development	2	2021	4	2025
OFP CD&I Release 1	3	2021	3	2024
OFP CD&I Release 2	3	2023	3	2025
OFP CD&I Release 3	3	2024	3	2025
Radar Enhancements Suite 9 Fielding	1	2019	3	2021
Infrared Search and Track Integration and Test	1	2019	4	2023
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS) Development	1	2019	2	2021
ADS-B Contract Award	3	2019	3	2019
Mobile User Objective System (MUOS) Second Generation Anti-jam Tactical UUF Radio for NATO (SATURN) Study	2	2019	4	2019
ALQ-128a	3	2019	3	2021
Advanced Crew Station	3	2020	4	2025
Data Transfer Module II	2	2020	4	2022