Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
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 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	308.218	203.183	336.079	0.000	336.079	382.204	185.237	188.136	70.442	Continuing	Continuing
670131: *F-15 Advanced Development*	0.000	42.107	0.000	67.400	0.000	67.400	0.000	0.000	0.000	0.000	0.000	109.507
676020: *F-15*	0.000	266.111	203.183	268.679	0.000	268.679	382.204	185.237	188.136	70.442	Continuing	Continuing

Note

This program, BA 7, PE 0207134F, project 670131, F-15EX, is a new start.
This program, BA 7, PE 0207134F, project 676020, F-15E Digital Color Display, is a new start.
This program, BA 7, PE 0207134F, project 676020, F-15E Data Transfer Module II, is a new start.

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.

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 elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
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*

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 2018 Air Force penalty total is $14.373M. 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. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	320.271	192.883	241.404	0.000	241.404
Current President's Budget	308.218	203.183	336.079	0.000	336.079
Total Adjustments	0.000	0.000	94.675	0.000	94.675
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	94.675	0.000	94.675

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: 676020: *F-15*		
Congressional Add: *ALQ-128a*	-	50.000
Congressional Add Subtotals for Project: 676020	-	50.000
Congressional Add Totals for all Projects	-	50.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
670131: *F-15 Advanced Development*	0.000	42.107	0.000	67.400	0.000	67.400	0.000	0.000	0.000	0.000	0.000	109.507
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0207134F, project 670131, F-15EX, is a new start.

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 structures 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 35 years old with over 8,300 flight hours; the oldest F-15C was delivered in 1979. Logistics, maintenance, and training activities will heavily leverage existing the F-15 infrastructure.

ADCP II develops a common mission computer for the F-15C and F-15E. The current mission computers of both platforms have reached their limits of speed, memory and throughput. Additionally, digital systems have changed the security requirements of both platforms and the older mission computers cannot be upgraded to meet these new requirements. A common mission computer is expected to reduce future development and long term maintenance costs. The program will also develop a new F-15C cockpit display to replace an obsolete one. 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.

Mode 5 enables the NSA-mandated Mode 5 encryption and anti-jam for Air-Air Interrogator (AAI) and Identification Friend or Foe (IFF) systems. The Mode 5 program will remove, upgrade, and then replace the existing APX-114 and APX-119 on all F-15 aircraft in order to add Mode 5 capability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: F-15EX	-	-	67.400	-	67.400
Description: 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 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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). Pursue other non-recurring engineering activities to reduce integration risks. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** F-15EX will be a New Start program in FY20.					
Title: Advanced Display Core Processor (ADCP) II ***Description:*** Program provides a new central computer for the entire F-15E fleet, replacing the ADCP I. Program also provides a new central computer, Remote Interface Unit (RIU) and Vertical Situation Display Replacement (VSDR)for the AESA-radar F-15C fleet, replacing the VCC and the existing F-15C Vertical Situation Display. This includes technical and acquisition-related studies. ***FY 2019 Plans:*** Program funding ends in FY18 ***FY 2020 Base Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	40.918	0.000	0.000	-	0.000
Title: Mode 5 ***Description:*** Mode 5 enables the NSA-mandated Mode 5 encryption and anti-jam for Air-Air Interrogator (AAI) and Identification Friend or Foe (IFF) systems. The Mode 5 program will remove, upgrade, and then replace the existing APX-114 and APX-119 on all F-15 aircraft in order to add Mode 5 capability. ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:***	1.189	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A					
Accomplishments/Planned Programs Subtotals	42.107	0.000	67.400	0.000	67.400

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 01 F015E0: *F-15EX*	-	-	1,050.000	-	1,050.000	1,652.000	1,685.000	1,719.000	1,753.000	Continuing	Continuing
• APAF 05 Line Item F01500: *F-15 Modification of in Service Aircraft (PEs 0207130F, 0207134F, 0207445F, 0809731F)*	137.882	103.066	169.200	0.000	169.200	144.726	74.673	76.042	51.517	0.000	757.106
• APAF 06 000999: *Initial Spares/Repair Parts (BP16)*	0.296	4.061	3.428	-	3.428	17.388	9.190	9.440	0.000	0.000	43.803
• APAF 07 F0150P: *F-15 Post Production Support*	0.000	0.000	7.500	-	7.500	4.500	4.500	0.000	0.000	0.000	16.500

Remarks

D. Acquisition Strategy

Development funds for F-15C/D and F-15E fleets 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.

At this time, the F-15EX acquisition strategy is pre-decisional since it has not been approved by the Milestone Decision Authority (MDA). However, 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 these systems are all projected to be mature when required for integration in the F-15EX, the acquisition strategy is deemed low risk. To rapidly field the F-15EX, the USAF plans to authorize long-lead procurements shortly after contract award, and focus engineering activities on ramping up the production line capacity and integrating existing systems. 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.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
F-15EX	SS/CPFF	Boeing : St Louis, MO	0.000	-		-		67.400	Jun 2020	-		67.400	0.000	67.400	-
F-15 ADCP II Contract	SS/CPIF	Boeing : St Louis, MO	0.000	38.418	Nov 2017	-		-		-		-	0.000	38.418	-
F-15 ADCP II	C/Various	Various : Various	0.000	-		-		-		-		-	0.000	0.000	-
F-15 Mode 5	SS/ Various	Boeing : St Louis, MO	0.000	1.189	Feb 2019	-		-		-		-	0.000	1.189	-
		Subtotal	0.000	39.607		-		67.400		-		67.400	0.000	107.007	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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support Costs	Various	Various : Various	0.000	2.500	Sep 2018	-		-		-		-	0.000	2.500	-
		Subtotal	0.000	2.500		-		-		-		-	0.000	2.500	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 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	42.107		0.000		67.400		-		67.400	0.000	109.507	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 670131 / *F-15 Advanced Development*

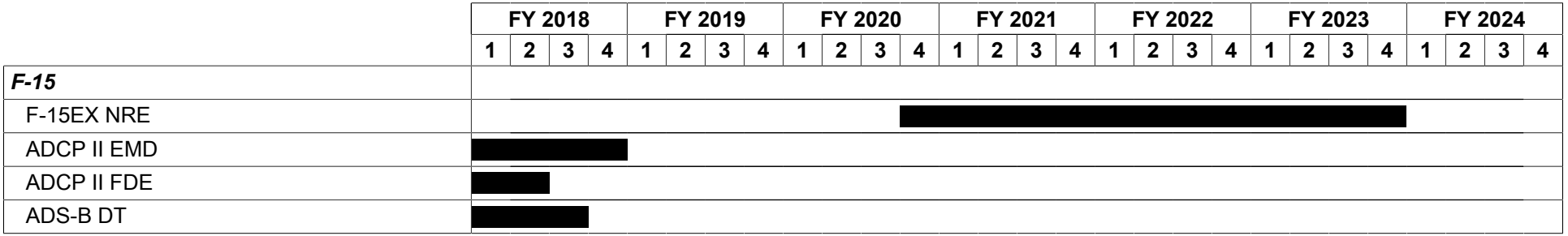

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 670131 / *F-15 Advanced Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F-15				
F-15EX NRE	4	2020	4	2023
ADCP II EMD	1	2018	4	2018
ADCP II FDE	1	2018	2	2018
ADS-B DT	1	2018	3	2018

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
676020: *F-15*	0.000	266.111	203.183	268.679	0.000	268.679	382.204	185.237	188.136	70.442	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 7, PE 0207134F, project 676020, F-15E Digital Color Display, is a new start.
This program, BA 7, PE 0207134F, project 676020, F-15E Data Transfer Module II, is a new start.

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 allows the Air Force to release software upgrades approximately every 2 to 3 years. 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 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

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).

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 elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Operational Flight Program (OFP) Development Efforts	111.047	33.992	73.493	-	73.493
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 2019 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, 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. Begin work on Future OFP's. Perform technical and acquisition related studies to ensure F-15 lethality and survivability beyond 2040.					
FY 2020 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, 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 lethality and survivability beyond 2040. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities.					
FY 2019 to FY 2020 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding increased for increased OFP efforts					
Title: Flight Test ***Description:*** Flight tested improvements initiated in prior years. 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 2019 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 radar test aircraft instrumentation. Continues design of replacement radar test aircraft obsolete instrumentation. Continue Richter Lab modernization and sustainment provisions. Continue support to 896 TSS with additional manpower, to include prefabrication and surge capability, during increased F-15 modernization activity. This includes technical and acquisition-related studies. ***FY 2020 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 radar test aircraft 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. This includes technical and acquisition-related studies. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to additional flight test efforts.	28.744	17.314	27.346	0.000	27.346
Title: F-15 Radar Enhancements ***Description:*** Improvements to F-15 Radar Enhancements (EP). This includes technical and acquisition related studies.	49.892	45.831	69.523	-	69.523

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: Continue implementation of EP into S9 and into Future 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. This includes technical and acquisition-related studies. ***FY 2020 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. This includes technical and acquisition-related studies. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased radar enhancement efforts					
Title: F-15 Infrared Search and Track (IRST)	57.256	45.376	18.272	-	18.272
Description: The Infrared Search and Track (IRST) system provides F-15C/Ds 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, provides a passive infrared sensor system that searches for and detects infrared energy, and provides the aircraft mission computer track file data on infrared targets. ***FY 2019 Plans:*** Continue technical and acquisitions studies, integration into OFP, EMD asset build and qualification, integration testing and flight test. Begin integration of advanced sensors. ***FY 2020 Base Plans:*** Continue technical and acquisitions studies, integration into OFP, EMD asset build and qualification, integration testing and flight test. Continue integration of advanced sensors. Continue integration efforts to ensure system wide acceptance of new hardware/software and desired capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding decreased due to OFP 7.2 integration finishing and 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 2019 Plans:*** FY 2019 Plan: Initiate study to identify gap and COAs; purchase preliminary test units and begin to integrate with GFP. Beginning of integration to the OFP's. Begin development of group A hardware. ***FY 2020 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to OFP 7.2 integration finishing and OFP 9.2 integration ramping up.	0.000	4.000	65.000	-	65.000
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 2019 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. ***FY 2020 Base 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 2019 to FY 2020 Increase/Decrease Statement:***	15.672	6.670	11.320	-	11.320

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding increased due to an increase in integration costs.					
Title: Service Life Extension Program (SLEP) Wing Replacement ***Description:*** The F-15C full scale fatigue test indicated the aircraft wing will not reach the required service life of 2045. This service life extension effort provides improved wings and internal components that may reduce Program Depot Maintenance requirements and supports ongoing development efforts. ***FY 2019 Plans:*** Continue with developmental testing for the F-15C Wing variant and internal components. Conduct airworthiness assessment activities. This includes technical and acquisition-related studies ***FY 2020 Base Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	1.470	0.000	0.000	-	0.000
Title: Cabin Pressure Indicator ***Description:*** Cabin Pressure Indicator is an aircraft safety modification to help address situations in which aircrew incapacitation due to hypoxia may occur. The upgrade adds an improved cabin pressurization indication system to increase aircrew situational awareness when a gradual loss of cabin pressure occurs. Cabin Pressure Indicator was approved by Congress as a safety modification in FY16 ***FY 2019 Plans:*** N/A ***FY 2020 Base Plans:*** N/A	2.030	0.000	0.000	-	0.000
Title: F-15E Digital Color Display ***Description:*** Digital Color Display will replace 2 F-15E current displays (1 in each cockpit) with digital color displays that allow for accurate distinction and identification of targets, ease pilot workload, improve identification of targets and friendlies, increase target accuracy, and decrease risk of frat/missed targeting. ***FY 2019 Plans:***	-	0.000	1.275	0.000	1.275

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2020 Base Plans:*** 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 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program Funding begins in FY20.					
Title: F-15E Data Transfer Module II ***Description:*** Data Transfer Module II will replace current 2MB memory system with an updated data transfer device to improve mission planning capability and update interfaces. ***FY 2019 Plans:*** N/A ***FY 2020 Base 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program Funding begins in FY20.	-	0.000	2.450	-	2.450
Accomplishments/Planned Programs Subtotals	266.111	153.183	268.679	0.000	268.679

	FY 2018	FY 2019
Congressional Add: ALQ-128a	-	50.000
FY 2019 Plans: 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.		

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

	FY 2018	FY 2019
Complete Engineering and Manufacturing Development (EMD) and Integration.		
Congressional Adds Subtotals	-	50.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APAF 05 Line Item F01500: *F-15 Modification of In-Service Aircraft, PEs 0207130, 0207134, 0207445, 0809731*	293.235	338.622	311.873	-	311.873	516.771	199.348	216.004	206.004	Continuing	Continuing
• APAF 06 Line Item 000999: *Initial Spares/Repair Parts (BP16)*	6.176	7.718	34.718	-	34.718	39.173	12.048	12.624	20.401	Continuing	Continuing
• APAF 07 Line Item F0150P: *F-15 Post Production Support*	28.900	52.271	43.356	-	43.356	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

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.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OFP Suite 8/9/10 Development and Test	SS/ Various	Boeing : St. Louis, MO	0.000	108.547	Aug 2018	30.492	Aug 2019	69.743	Aug 2020	-		69.743	Continuing	Continuing	-
F-15 Radar Enhancement	SS/ Various	Boeing : St Louis, MO	0.000	49.892	Aug 2018	45.831	Aug 2019	69.523	Aug 2020	-		69.523	Continuing	Continuing	-
F-15 Infrared Search and Track	SS/ Various	Boeing : St Louis, MO	0.000	57.256	Aug 2018	45.376	Feb 2019	18.272	Feb 2020	-		18.272	Continuing	Continuing	-
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS)	SS/ Various	Boeing : St. Louis, MO	0.000	15.672	Jul 2018	6.670	Feb 2019	11.320	Feb 2020	-		11.320	Continuing	Continuing	-
Service Life Extension Program (SLEP) Wing Replacement	TBD	Not specified. : NV	0.000	1.470	Jan 2019	-		-		-		-	0.000	1.470	-
Cabin Pressure Indicator	TBD	TBD : Various	0.000	2.030	Jun 2019	-		-		-		-	0.000	2.030	-
Mobile User Objective System (MUOS) /Second Generation Anti-jam Tactical UHF Radio for NATO (SATURN)	C/CPAF	Boeing : St. Louis	0.000	-		4.000	Mar 2019	65.000	Jan 2020	-		65.000	Continuing	Continuing	-
F-15E Digital Color Display	TBD	TBD : TBD	0.000	-		-		1.275	Oct 2019	-		1.275	Continuing	Continuing	-
F-15E Data Transfer Module II	TBD	TBD : TBD	0.000	-		-		2.450	Apr 2020	-		2.450	Continuing	Continuing	-
ALQ-128a	TBD	TBD : TBD	0.000	-		45.176		-		-		-	0.000	45.176	-
		Subtotal	0.000	234.867		177.545		237.583		-		237.583	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 2020 Air Force		Date: February 2019
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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Boeing (Contractor Test Support)	SS/CPFF	Boeing : St. Louis, MO	0.000	28.744	Aug 2018	17.314	Aug 2019	27.346	Aug 2020	-		27.346	Continuing	Continuing	-
		Subtotal	0.000	28.744		17.314		27.346		-		27.346	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 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Mgt Support Costs	Various	Various : Various	0.000	2.500	Sep 2018	8.324	Sep 2019	3.750	Sep 2020	-		3.750	Continuing	Continuing	-
		Subtotal	0.000	2.500		8.324		3.750		-		3.750	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 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	266.111		203.183		268.679		-		268.679	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

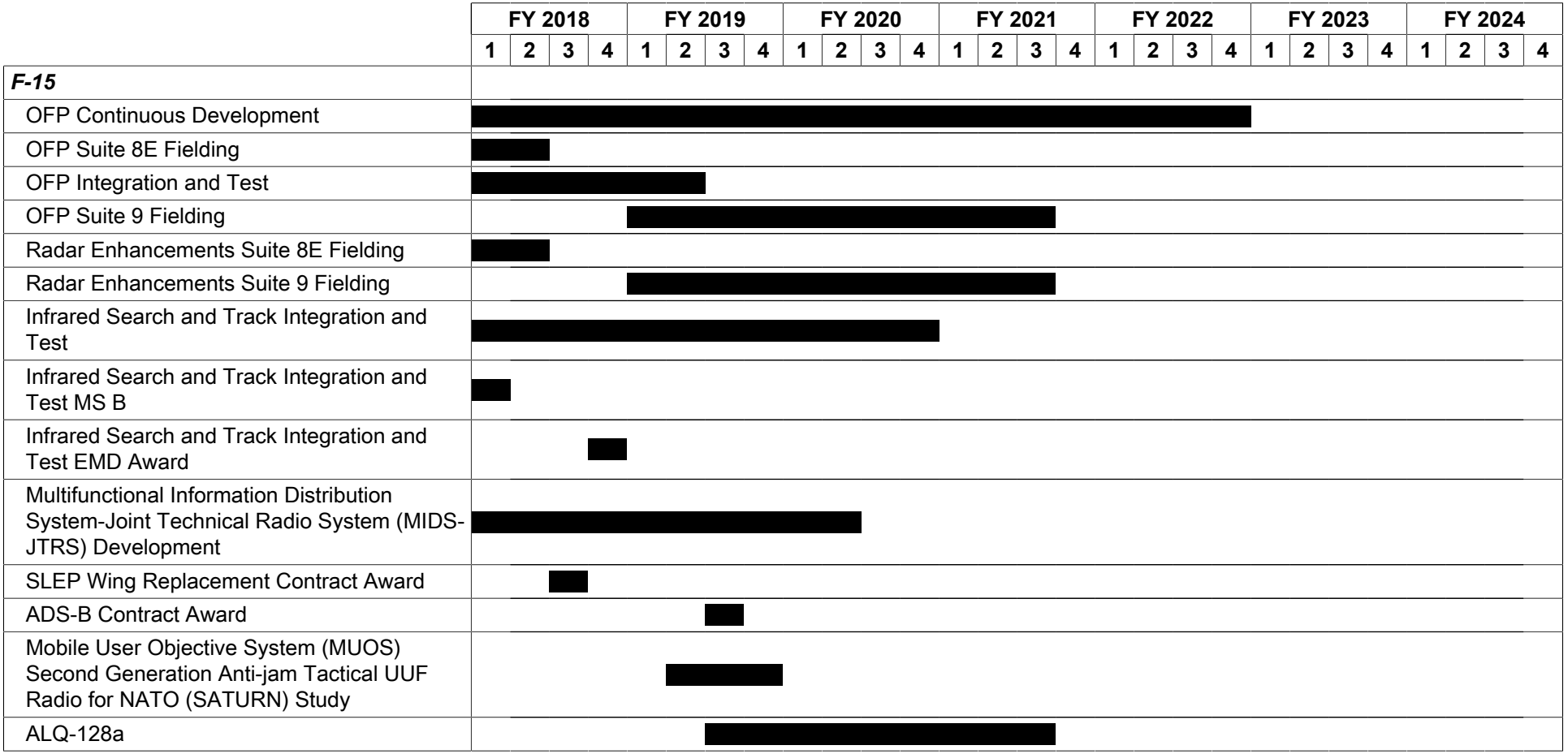

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0207134F / *F-15E Squadrons*	**Project (Number/Name)** 676020 / *F-15*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F-15				
OFP Continuous Development	1	2018	4	2022
OFP Suite 8E Fielding	1	2018	2	2018
OFP Integration and Test	1	2018	2	2019
OFP Suite 9 Fielding	1	2019	3	2021
Radar Enhancements Suite 8E Fielding	1	2018	2	2018
Radar Enhancements Suite 9 Fielding	1	2019	3	2021
Infrared Search and Track Integration and Test	1	2018	4	2020
Infrared Search and Track Integration and Test MS B	1	2018	1	2018
Infrared Search and Track Integration and Test EMD Award	4	2018	4	2018
Multifunctional Information Distribution System-Joint Technical Radio System (MIDS-JTRS) Development	1	2018	2	2020
SLEP Wing Replacement Contract Award	3	2018	3	2018
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