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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0604201F I Integrated Avionics Planning and Development							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	65.458	0.000	65.458	15.006	0.000	0.000	0.000	Continuing	Continuing
641029: GPS Receiver Development	-	0.000	0.000	5.014	0.000	5.014	0.000	0.000	0.000	0.000	Continuing	Continuing
641030: GPS Receiver Development	-	0.000	0.000	60.444	0.000	60.444	15.006	0.000	0.000	0.000	Continuing	Continuing

Note

In FY2018, specific efforts initiated under PE 0305164F, NAVSTAR Global Positioning System (User Equipment) (Space), Project 643833, Military Global Positioning System User Equipment, were transferred to PE 0604201F, Integrated Avionics Planning & Development, Project 641029, Aircraft-Store development, to realign resources with the execution responsibilities supporting aircraft weapon system platforms.

In FY2018, M-Code efforts initiated under PE 0207325F (Joint Air-Surface Standoff Missile-Extended Range), PE 0604329F (Small Diameter Bomb II), PE 0604270F (Advanced IR Counter Measures), 0604327F (Hard and Deeply Buried Targets System) and PE 0604618F (Joint Direct Attack Munition) were transferred to PE 0604201F, Integrated Avionics Planning & Development, Project 641030, Munitions Receiver Development for transparency to stakeholders and to realign resources with the organization executing the efforts.

A. Mission Description and Budget Item Justification

PE 0604201F, Project 641029 conducts navigation-aircraft interface standard development to include the Universal Navigation Interface (UNI). UNI develops, enhances, and implements standardized interfaces in current/future aircraft and mission planning to support integration of EGI receivers independent of Operational Flight Program (OFP) cycles. Standardization of navigation-aircraft interface enables a more affordable approach and faster upgrade capabilities to an ever changing threat to navigation accuracy.

PE 0604201F, Project 641030 covers the development, integration and testing of Enhanced Anti-Jam (EAJ) Military Code (M-Code) GPS receivers for AF and joint weapon systems. This includes updates to weapon mission planning software to support new M-Code and EAJ receiver development. These acquisitions will enable the Air Force to increase its operational PNT resiliency while satisfying the DoD and civil mandates. Fielding of EAJ M-Code weapons requires the development, integration and testing of M-Code receivers across the AFPEO Weapons Portfolio.

This program is in Budget Activity 4, Demonstration and Validation, 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. Production funding for modernized airborne receivers is the responsibility of the using platforms and is not covered in this PE.

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3600: Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604201F I Integrated Avionics Planning and Development			
B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	65.458	0.000	65.458
Total Adjustments	0.000	0.000	65.458	0.000	65.458
• 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	65.458	0.000	65.458
Change Summary Explanation					
FY2018 increase a result of transparency realignment to stand alone PE. \$14.856M ZBT from PE 0604618F, BPAC 653891, PEC JDAM M-Code Integration.					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0604201F / Integrated Avionics Planning and Development				Project (Number/Name) 641029 / GPS Receiver Development			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
641029: GPS Receiver Development	-	0.000	0.000	5.014	0.000	5.014	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY18, efforts initiated under PE 0305164F, NAVSTAR Global Positioning System (User Equipment) (Space), Project 643833, Military Global Positioning System User Equipment were transferred to PE 0604201F, Integrated Avionics Planning & Development, Project 651029, Aircraft-Store Development for transparency and to realign resources with the execution responsibilities supporting aircraft weapon system platforms.

A. Mission Description and Budget Item Justification

PE 0604201, Project 641029 conducts navigation-aircraft interface standard development to include the Universal Navigation Interface (UNI). The Universal Navigation Interface project develops, enhances, and implements standardized interfaces in current/future aircraft and mission planning to support integration of EGI receivers independent of Operational Flight Program (OFP) cycles. Standardization of navigation-aircraft interface enables a more affordable approach and faster upgrade capabilities to an ever changing threat to navigation accuracy.

This program is in Budget Activity 4, Demonstration and Validation, 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 2016	FY 2017	FY 2018
Title: UNI	0.000	0.000	5.014
Description: Conducts navigation-aircraft interface standard development to include the Universal Navigation Interface (UNI). Develops standardized software interfaces in aircraft and mission planning to support integration of EGI receiver boxes capable of receiving Modernized GPS signals (M-code).			
FY 2016 Accomplishments: N/A			
FY 2017 Plans: N/A			
FY 2018 Plans: Conduct studies and risk reduction activities to define standard interfaces across multiple platforms. Award development contract.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.014

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017	
Appropriation/Budget Activity 3600 / 4				R-1 Program Element (Number/Name) PE 0604201F / <i>Integrated Avionics Planning and Development</i>				Project (Number/Name) 641029 / <i>GPS Receiver Development</i>			
C. Other Program Funding Summary (\$ in Millions)											
			<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2018</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Complete</u>	<u>Total Cost</u>
• RDTE: BA05: PE0305164F: <i>NAVSTAR Global Positioning System User Equipment</i>	0.000	36.912	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	36.912
Remarks											
In FY2018, PE 0305164F, NAVSTAR Global Positioning System (User Equipment) (Space), Project 643833, Military Global Positioning System User Equipment partial efforts were transferred to PE 0604201F, Integrated Avionics Planning & Development, Project 641029, STORES – Aircraft Interface for transparency and to realign resources with execution responsibilities that support various aircraft weapon system platforms.											
D. Acquisition Strategy											
Award delivery order on existing contract with scope to accomplish risk reduction and complete initial Interface Control Document.											
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.											

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 0604201F / Integrated Avionics Planning and Development				Project (Number/Name) 641030 / GPS Receiver Development			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
641030: GPS Receiver Development	-	0.000	0.000	60.444	0.000	60.444	15.006	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018, M-Code efforts initiated under PE 0207325F (Joint Air-Surface Standoff Missile-Extended Range), PE 0604329F (Small Diameter Bomb II), PE 0604270F (Advanced IR Counter Measures), 0604327F (Hard and Deeply Buried Targets System) and PE 0604618F (Joint Direct Attack Munition) were transferred to PE 0604201F, Integrated Avionics Planning & Development, Project 641030, Munitions Receiver Development for transparency to stakeholders and to realign resources with the organization executing the efforts.

A. Mission Description and Budget Item Justification

This munitions receiver development project includes development of a GPS military code (M-code) receiver with enhanced anti-jam (EAJ) and analysis efforts. M-code and Enhanced Anti-Jam (EAJ) develops and integrates advanced precision, navigation, and timing (PNT) capabilities to provide the capability to operate in adversarial anti-access/area denial (A2/AD). M-Code and EAJ also provides increased accuracy, better signal acquisition, and advanced security.

Current GPS guided weapons require M-code with enhanced anti-jam (EAJ) receivers in order to operate in an A2/AD jamming environments. M-code with EAJ assures continued weapon system precision and lethality.

Fielding EAJ M-Code weapons requires the development, integration, testing and mission planning of M-Code receivers across the Weapons Portfolio. This will include all systems, subsystems, and software associated with implementation of M-code.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018
Title: M-Code EAJ	-	-	60.444
Description: M-Code/EAJ provides an enhanced anti-jam capability. M-Code and EAJ provides the capability to operate in increasing adversarial A2/AD jamming environment. M-Code/EAJ also provides increased accuracy, better signal acquisition, and advanced security.			
FY 2018 Plans: Develop M-code/EAJ receivers for implementation across the AFPEO weapons portfolio.			
Accomplishments/Planned Programs Subtotals	-	-	60.444

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Appropriation/Budget Activity 3600 / 4				R-1 Program Element (Number/Name) PE 0604201F / Integrated Avionics Planning and Development				Project (Number/Name) 641030 / GPS Receiver Development			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• RDTE: BA07: PE 0207325F: BPAC 67...: JASSAM-ER	0.000	12.200	1.600	0.000	1.600	32.600	1.400	14.000	12.000	0.00	73.800
• RDTE: BA05: PE 0604329F : BPAC 6...: SDB Increment II	0.000	23.700	17.800	0.000	17.800	42.200	12.100	11.000	21.000	0.00	127.800
• RDTE: BA05: PE 0604270F: BPAC 65...: Adv Infrared Counter Measures	0.000	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	10.000
• RDTE: BA04: PE 0604327F: BPAC 64...: Direct Strike Penetrators	0.000	59.400	0.000	0.000	0.000	33.500	2.200	0.000	0.000	0.00	95.100
• RDTE: BA05: PE 0604618F: BPAC 65...: JDAM Development	0.000	9.901	0.000	0.000	0.000	15.906	0.000	8.001	0.000	0.00	33.808
Remarks											
D. Acquisition Strategy											
M-code/EAJ effort will be under multiple contract awards.											
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.											

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force												Date: May 2017			
Appropriation/Budget Activity 3600 / 4						R-1 Program Element (Number/Name) PE 0604201F / <i>Integrated Avionics Planning and Development</i>						Project (Number/Name) 641030 / <i>GPS Receiver Development</i>			
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
M-code Receiver Development	Various	Various : TBD	-	0.000		0.000		40.000	Mar 2018	0.000		40.000	Continuing	Continuing	-
Subtotal			-	0.000		0.000		40.000		0.000		40.000	-	-	-
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
M-Code Receiver Development Support	Various	TBD : TBD	-	0.000		0.000		1.000	Mar 2018	0.000		1.000	Continuing	Continuing	-
Subtotal			-	0.000		0.000		1.000		0.000		1.000	-	-	-
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
M-Code Receiver Development Test and Evaluation	RO	Various : TBD	-	0.000		0.000		17.444	Oct 2017	0.000		17.444	Continuing	Continuing	-
Subtotal			-	0.000		0.000		17.444		0.000		17.444	-	-	-
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
M-Code Receiver Development PMA	Various	Various : TBD	-	0.000		0.000		2.000	Oct 2017	0.000		2.000	Continuing	Continuing	-
Subtotal			-	0.000		0.000		2.000		0.000		2.000	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force										Date: May 2017							
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					Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals					-	0.000		0.000		60.444		0.000		60.444	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force																Date: May 2017			
Appropriation/Budget Activity 3600 / 4								R-1 Program Element (Number/Name) PE 0604201F / Integrated Avionics Planning and Development								Project (Number/Name) 641030 / GPS Receiver Development			

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604201F / <i>Integrated Avionics Planning and Development</i>	Project (Number/Name) 641030 / <i>GPS Receiver Development</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
M-Code Receiver Development	1	2018	4	2021