Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

3600: Research, Development, Test & Evaluation, Air Force

PE 0604830F: Automated Air-to-Air Refueling

BA 4: Advanced Component Development & Prototypes (ACD&P)

-	-		-								
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	9.610	43.158	0.085	0.000	0.085	0.000	0.000	0.000	0.000	Continuing	Continuing
642214: Optionally Unmanned Development	9.610	43.158	0.085	0.000	0.085	0.000	0.000	0.000	0.000	0.000	0.000

### A. Mission Description and Budget Item Justification

(U) A. Mission Description and Budget Item Justification

This program develops single channel Precision GPS (PGPS) system to support Automated Aerial Refueling (AAR) for future manned and unmanned air systems (UAS)

The FY10 funding will support the development of the single channel PGPS and close out of the Automated Aerial Refueling Phase II Program. This funding supports open loop flight demonstration of real-time PGPS performance.

From FY04-08, the Next Generation Bomber PE 0604015F funded critical technology maturation and risk reduction efforts that could feed into a long-range strike platform in the future. AAR Phase II is a critical technology for future manned and unmanned long-range strike operations. AAR Phase I technology has been demonstrated, but it requires additional maturation, development, and integration to be demonstrated for operational utility.

Automated Air-to-Air Refueling is categorized as a Budget Activity 4, Advanced Component Development, and Prototypes, since advanced technologies will be explored and integrated for demonstration in a realistic operating environment.

**R-1 ITEM NOMENCLATURE** 

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force

**DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY

3600: Research, Development, Test & Evaluation, Air Force

BA 4: Advanced Component Development & Prototypes (ACD&P)

PE 0604830F: Automated Air-to-Air Refueling

**B. Program Change Summary (\$ in Millions)** 

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	9.862	43.158	0.000	0.000	0.000
Current President's Budget	9.610	43.158	0.085	0.000	0.085
Total Adjustments	-0.252	0.000	0.085	0.000	0.085
<ul> <li>Congressional General Reductions</li> </ul>		0.000			
<ul> <li>Congressional Directed Reductions</li> </ul>		0.000			
<ul> <li>Congressional Rescissions</li> </ul>	0.000	0.000			
<ul> <li>Congressional Adds</li> </ul>		0.000			
<ul> <li>Congressional Directed Transfers</li> </ul>		0.000			
Reprogrammings	0.000	0.000			
SBIR/STTR Transfer	0.000	0.000			
<ul> <li>Other Adjustments</li> </ul>	-0.252	0.000	0.085	0.000	0.085

## **Change Summary Explanation**

The FY 2010 President's Budget submittal did not reflect FY 2011 though FY 2015 funding. Therefore, explanation of changes between the two budget positions cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		<b>DATE:</b> February 2010
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE	PROJECT
3600: Research, Development, Test & Evaluation, Air Force	PE 0604830F: Automated Air-to-Air Refueling	642214: Optionally Unmanned Development
BA 4: Advanced Component Development & Prototypes (ACD&P)		

COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
642214: Optionally Unmanned Development	9.610	43.158	0.085	0.000	0.085	0.000	0.000	0.000	0.000	0.000	0.000
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

## A. Mission Description and Budget Item Justification

(U) A. Mission Description and Budget Item Justification

This program develops single channel Precision GPS (PGPS) system to support Automated Aerial Refueling (AAR) for future manned and unmanned air systems (UAS)

The FY10 funding will support the development of the single channel PGPS and close out of the Automated Aerial Refueling Phase II Program. This funding supports open loop flight demonstration of real-time PGPS performance.

From FY04-08, the Next Generation Bomber PE 0604015F funded critical technology maturation and risk reduction efforts that could feed into a long-range strike platform in the future. AAR Phase II is a critical technology for future manned and unmanned long-range strike operations. AAR Phase I technology has been demonstrated, but it requires additional maturation, development, and integration to be demonstrated for operational utility.

Automated Air-to-Air Refueling is categorized as a Budget Activity 4, Advanced Component Development, and Prototypes, since advanced technologies will be explored and integrated for demonstration in a realistic operating environment.

## B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MAJOR THRUST: Development of flight control and precision navigation (PGPS) systems for initial capability of automated air-to-air refueling	9.610	43.158	0.085	0.000	0.085

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

PROJECT

3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P)

PE 0604830F: Automated Air-to-Air Refueling

642214: Optionally Unmanned Development

### B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments:					
In FY 2009: Develop flight control and precision navigation (PGPS) systems for initial capability of automated air-to-air refueling and the integration and testing of automated air-to-air refueling flight controls and precision navigation initial capability					
FY 2010 Plans:					
In FY 2010: Integrate and start testing automated air-to-air refueling flight controls and precision navigation initial capability using a KC-135 tanker and a limited test aircraft. Continue development of the single channel PGPS and begin close out of the Automated Aerial Refueling Phase II Program. This funding supports open loop flight demonstration of real-time PGPS performance.					
FY 2011 Base Plans:					
In FY 2011: Finishes close-out of Automated Aerial Refueling Program.					
FY 2011 OCO Plans:					
In FY 2011 OCO: Not Applicable.					
Accomplishments/Planned Programs Subtotals	9.610	43.158	0.085	0.000	0.085

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

			FY 2011	<u>FY 2011</u>	FY 2011					Cost To	
<u>Line Item</u>	FY 2009	FY 2010	<u>Base</u>	OCO	<u>Total</u>	FY 2012	FY 2013	FY 2014	FY 2015	Complete	<b>Total Cost</b>
• PE Not Provided (14752):	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
A ativity Alat Dravidad											

Activity Not Provided

# **D. Acquisition Strategy**

Principal acquisitions to be performed through Broad Area Announcements (BAA) resulting in competitive Cost Plus Fixed Fee contracts.

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		<b>DATE:</b> February 2010
APPROPRIATION/BUDGET ACTIVITY  3600: Research, Development, Test & Evaluation, Air Force  3A 4: Advanced Component Development & Prototypes (ACD&P)	R-1 ITEM NOMENCLATURE PE 0604830F: Automated Air-to-Air Refueling	PROJECT 642214: Optionally Unmanned Development
E. Performance Metrics  Please refer to the Performance Base Budget Overview Book for inforr Force performance goals and most importantly, how they contribute to		d how those resources are contributing to Air

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force

**DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY

3600: Research, Development, Test & Evaluation, Air Force

BA 4: Advanced Component Development & Prototypes (ACD&P)

R-1 ITEM NOMENCLATURE

PE 0604830F: Automated Air-to-Air Refueling

**PROJECT** 

642214: Optionally Unmanned Development

## **Product Development (\$ in Millions)**

				FY 2010		FY 2 Ba	-	FY 2		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Precision GPS Development	C/CPFF	Northrop Grumman Woodland Hills, CA	4.000	9.500		0.000		0.000		0.000	0.000	13.500	0.000
Tactical Targeting Network Technology (TTNT)	C/CPFF	Rockwell Collins Cedar Rapids IA	0.100	0.200		0.000		0.000		0.000	0.000	0.300	0.000
Phase II System Development and Demonstration	C/CPFF	Boeing St Louis, MO	3.900	18.260		0.000		0.000		0.000	0.000	22.160	0.000
		Subtotal	8.000	27.960		0.000		0.000		0.000	0.000	35.960	0.000

#### **Remarks**

## Test and Evaluation (\$ in Millions)

				FY 2	010	FY 2 Bas	-			FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Precision GPS Testing	TBD/TBD	Calspan Buffalo, NY	0.100	2.000		0.000		0.000		0.000	0.000	2.100	0.000
Tanker Modification Development	ТМ	Rockwell Collins Oklahoma City, OK	0.300	1.500		0.000		0.000		0.000	0.000	1.800	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force

**DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

**PROJECT** 

3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P) PE 0604830F: Automated Air-to-Air Refueling

642214: Optionally Unmanned Development

Test and Evaluation (\$ in Millions)

				FY 2	FY 2010		2011 se	FY 2	-	FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Refueling Receiver Development	C/CPFF	Calspan Buffalo, NY	0.200	4.000		0.000		0.000		0.000	0.000	4.200	0.000
VISTA F-16 Development	C/CPFF	Lockheed Martin Ft Worth, TX	0.000	1.000	Dec 2009	0.000		0.000		0.000	0.000	1.000	0.000
Flight Test	Various/ Various	Various Various	0.350	4.198		0.000		0.000		0.000	0.000	4.548	0.000
		Subtotal	0.950	12.698		0.000		0.000		0.000	0.000	13.648	0.000

#### Remarks

## **Management Services (\$ in Millions)**

		FY 2	FY 2010 Fy 20				FY 2011 FY 2011 OCO Total						
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various/ Various	Various Various	0.660	2.500		0.085		0.000		0.085	0.000	3.245	0.000
		Subtotal	0.660	2.500		0.085		0.000		0.085	0.000	3.245	0.000

#### Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force

**DATE:** February 2010

APPROPRIATION/BUDGET ACTIVITY

**R-1 ITEM NOMENCLATURE** 

**PROJECT** 

3600: Research, Development, Test & Evaluation, Air Force BA 4: Advanced Component Development & Prototypes (ACD&P) PE 0604830F: Automated Air-to-Air Refueling

642214: Optionally Unmanned Development

	Total Prior	EV 2040		2011	FY 2	-	FY 2011	Cost To	Total Coat	Target Value of
	Years Cost	FY 2010	Ва	ise	00	co	Total	Complete	Total Cost	Contract
Project Cost Totals	9.610	43.158	0.085		0.000		0.085	0.000	52.853	0.000

#### Remarks

Total Prior Years Cost may include only FY 2009 data.

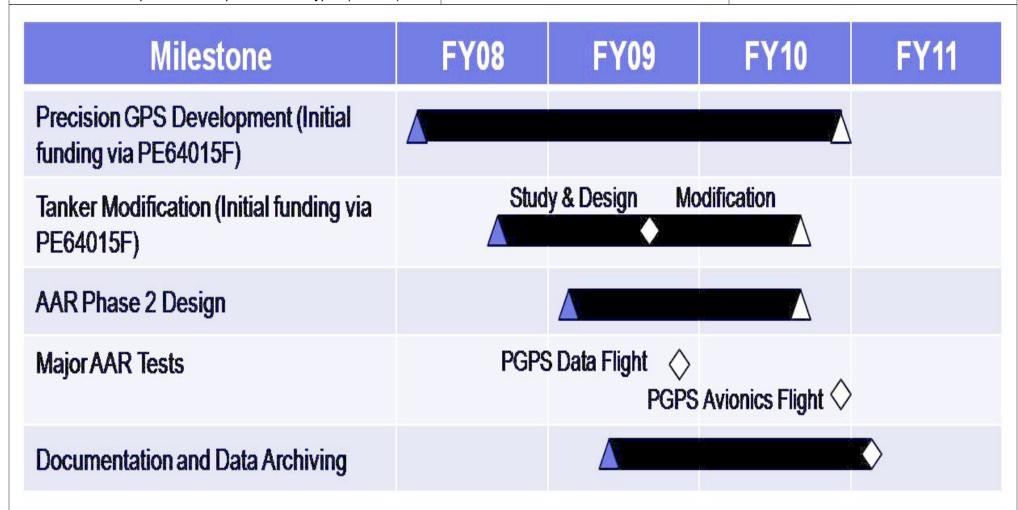
Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force

APPROPRIATION/BUDGET ACTIVITY

3600: Research, Development, Test & Evaluation, Air Force
BA 4: Advanced Component Development & Prototypes (ACD&P)

DATE: February 2010

R-1 ITEM NOMENCLATURE
PE 0604830F: Automated Air-to-Air Refueling
642214: Optionally Unmanned Development



#### **UNCLASSIFIED**

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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force

APPROPRIATION/BUDGET ACTIVITY

3600: Research, Development, Test & Evaluation, Air Force

BA 4: Advanced Component Development & Prototypes (ACD&P)

R-1 ITEM NOMENCLATURE

PE 0604830F: Automated Air-to-Air Refueling

**PROJECT** 

642214: Optionally Unmanned Development

## Schedule Details

	St	art	End	
Event	Quarter	Year	Quarter	Year
Precision GPS Development (Initial funding via PE64015F)	1	2009	4	2010
Tanker Modification (Initial funding via PE64015F)	1	2009	3	2010
AAR Phase 2 Design	1	2009	3	2010
PGPS Data Flight Test	4	2009	4	2009
PGPS Avionics Flight Test	4	2010	4	2010
Documentation and Data Archiving	2	2009	1	2011