

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 2000

BUDGET ACTIVITY

05 - Engineering and Manufacturing Development

PE NUMBER AND TITLE

0604201F Integrated Avionics Planning and Development

COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	9,775	712	712	0	0	0	0	0	65,032
652050 Joint Helmet Mounted Cueing System (JHMCS)	9,356	0	0	0	0	0	0	0	45,352
652257 Standard Avionics & JSRC Initiatives	419	712	712	0	0	0	0	0	19,680
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

Note - Project 2050 was realigned under new PE 0604012F Joint Helmet-Mounted Cueing System (JHMCS). Total costs for JHMCS through FY 99 are shown here and costs for FY 00 and later are shown in PE 0604012F.

* Total Air Force Cost

PE 0604201F: 45,352

PE 0604012F: 16,179

(U) A. Mission Description

This program element explores and develops integrated avionics architectures and components which will reduce acquisition and support costs, increase weapon system performance and availability, and foster weapons system interoperability with standard interfaces. This program element is devoted to the demonstration and Engineering and Manufacturing Development (EMD) of integrated avionics architectures and open systems. The scope is both domestic and international. Cost of ownership, Reliability and Maintainability (R&M) and deployment footprint play a major role in the identification of specific development efforts within this element. Joint avionics development efforts are pursued through participation in and support of the Joint Service Review Committee (JSRC).

(U) B. Budget Activity Justification

This is budget activity 5 - EMD, Research Category 6.4 because of the development nature of the effort.

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(U) **C. Program Change Summary (\$ in Thousands)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 2000 PBR)	10,643	723	718	69,360
(U) Appropriated Value	10,762	723		
(U) Adjustments to Appropriated Value				
a. Congressional/General Reductions	-89	-6		
b. Small Business Innovative Research	-348			
c. Omnibus or Other Above Threshold Reprogram		-5		
d. Below Threshold Reprogram	-465			
e. Rescissions	-85			
f. Other				
(U) Adjustments to Budget Years Since FY 2000 PBR			-6	
(U) Current Budget Submit/FY 2001 PBR	9,775	712	712	65,032
(U) <u>Significant Program Changes:</u>				

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 05 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development				PROJECT 652050	
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
652050 Joint Helmet Mounted Cueing System (JHMCS)	9,356	0	0	0	0	0	0	0	45,352
<p>Note - Project 2050 was realigned under new PE 0604012F Joint Helmet-Mounted Cueing System (JHMCS). Total costs for JHMCS through FY 99 are shown here and costs for FY 00 and later are shown in PE 0604012F.</p> <p>* Total Air Force Cost PE 0604201F: 45,352 (JHMCS) PE 0604012F: 16,179</p> <p>(U) <u>A. Mission Description</u> This Joint program with the USN will develop a helmet display system, capable of depicting aircraft heading data, pilot's viewing perspective, target indication graphics and digital information. Consolidating this information on the pilot's visor allows the pilot to quickly align sensors and weapons on targets and engage threats using high off-boresight angle weapons such as the AIM-9X. The JHMCS includes a helmet with a mounted visor display capability, a helmet-vehicle interface cable, and several other components. JHMCS is currently in Phase II, Engineering & Manufacturing Development (EMD).</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$7,424 Continued JHMCS EMD contract (U) \$978 Continued Test Support (AFFTC) (U) \$954 Continued Program Management Support (U) \$9,356 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$0 No activity in the PE (U) \$0 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u> (U) \$0 No activity in the PE (U) \$0 Total</p>									
Project 652050			Page 3 of 11 Pages				Exhibit R-2A (PE 0604201F)		

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 05 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development	PROJECT 652050
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(U) **B. Project Change Summary**

Funding:

FY 2000: Funding realigned to establish new Joint Helmet Mounted Cueing System (JHMCS) PE 0604012F.

FY 2001: Funding realigned to JHMCS PE 0604012F.

(U) **C. Other Program Funding Summary (\$ in Thousands)**

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) RDT&E, BA 5, PE 0604012F, JHMCS		2,931	1,312	2,926	2,944	3,004	3,063	0	16,180

(U) **D. Acquisition Strategy**

JHMCS is an ACAT III joint USAF/USN program (USAF - executive service). The contract structure is a Cost Plus Award Fee (CPAF) contract awarded in a competitive source selection environment. The CPAF contract is through Boeing - St. Louis for integration into the F-15 and F/A-18. Lockheed Martin will integrate JHMCS into the F-16 and F-22. Boeing has subcontracted to Vision Systems International (VSI) to provide JHMCS subsystems hardware/software. VSI is a partnership between Elbit (an Israeli company based in Ft Worth, TX) and Kaiser Electronics. The Joint Program Office is using a unique approach of developing common hardware as Contractor Furnished Equipment (CFE) to minimize platform integration risk. Milestone III Production Decision is scheduled for Sep 00.

(U) **E. Schedule Profile**

	<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>					
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Start Operational Assessment (F-15/F-18)					X							
(U) Functional Configuration Audit /Physical Configuration Audit					*							

* = Completed event

X = Planned event

Note - Efforts in FY00 and later are described in PE 0604012F

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY					PE NUMBER AND TITLE			PROJECT		
05 - Engineering and Manufacturing Development					0604201F Integrated Avionics Planning and Development			652050		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	EMD Effort					7,424				
(U)	Test Support (AFFTC)					978				
(U)	Prgram Management Support					954				
(U)	Total					9,356				
* Program funding for FY 2000 and later is described in PE 0604012F										
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>										
MDA/LMTAS	CPAF	2/97	39,097	39,097	31,696	7,424	0	0	0	39,120
<u>Support and Management Organizations</u>										
Various	Various	2/97	2,593	2,593	1,929	954	0	0	0	2,883
<u>Test and Evaluation Organizations</u>										
Various	Various	2/97	3,473	3,473	2,371	978	0	0	0	3,349
(U) Government Furnished Property:										
<u>Item Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>		<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Property</u>										
Not Applicable										
<u>Support and Management Property</u>										
Not Applicable										
Project 652050					Page 5 of 11 Pages			Exhibit R-3 (PE 0604201F)		

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)		DATE February 2000				
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT				
05 - Engineering and Manufacturing Development	0604201F Integrated Avionics Planning and Development	652050				
 (U) <u>Government Furnished Property Continued:</u>						
<u>Test and Evaluation Property</u>						
Not Applicable						
	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Subtotals</u>						
Subtotal Product Development	31,696	7,424	0	0	0	39,120
Subtotal Support and Management	1,929	954	0	0	0	2,883
Subtotal Test and Evaluation	2,371	978	0	0	0	3,349
Total Project	35,996	9,356	0	0	0	45,352
* Funding for FY00 and later described in PE 0604012F						

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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)							DATE February 2000		
BUDGET ACTIVITY 05 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development				PROJECT 652257	
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
652257 Standard Avionics & JSRC Initiatives	419	712	712	0	0	0	0	0	19,680
<p>(U) <u>A. Mission Description</u> This project identifies, demonstrates and/or develops candidate architecture standards and open system modular components for the Air Force and other services. Maintains/updates the common avionics database as a widely used avionics interoperability/standardization planning tool. Supports international avionics initiatives and standardization activities such as Global Air Traffic Management (GATM) Integrated Product Team. Develops an opportunity matrix for tactical and airlift programs to identify opportunities to leverage investments for aging avionics, parts obsolescence and avionics modernization. Common Avionics Modernization Planning is a pre-EMD project that explores candidate avionics systems and designs for potential developmental efforts and aircraft interoperability initiatives. The Joint Service Review Committee (JSRC) coordinates avionics standardization projects between the Air Force, Army and Navy.</p> <p>(U) <u>FY 1999 (\$ in Thousands)</u> (U) \$159 Continued Avionics Planning Baseline (U) \$55 Continued Logistics/Initiative Planning & Support (U) \$8 High-Speed Open Architecture--BUS Protocol (U) \$197 Continued Program Management Support (U) \$419 Total</p> <p>(U) <u>FY 2000 (\$ in Thousands)</u> (U) \$100 Continue Avionics Planning Baseline (U) \$130 Continue Logistics/Initiative Planning & Support (U) \$244 High-Speed Open Architecture--BUS Protocol (U) \$238 Continue Program Management Support (U) \$712 Total</p>									
Project 652257			Page 7 of 11 Pages				Exhibit R-2A (PE 0604201F)		

UNCLASSIFIED

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<p>(U) <u>A. Mission Description Continued</u></p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$160 Update Horizontal Avionics Modernization Planning</p> <p>(U) \$92 Continue Avionics Planning Baseline</p> <p>(U) \$140 Continue Logistics/Initiative Planning & Support</p> <p>(U) \$25 Update Tri-Service Standardization / JSRC</p> <p>(U) \$50 High-Speed Open Architecture--BUS Protocol</p> <p>(U) \$245 Continue Program Management Support</p> <p>(U) \$712 Total</p> <p>(U) <u>B. Project Change Summary</u></p> <p>Funding:</p> <p>FY 1999: Tri-Service Standardization / JSRC and HAMP were not approved requirements.</p> <p>FY 2000: Tri-Service Standardization / JSRC and HAMP were not approved requirements.</p> <p>(U) <u>C. Other Program Funding Summary (\$ in Thousands)</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:15%;"></th> <th style="width:10%;"><u>FY 1999</u></th> <th style="width:10%;"><u>FY 2000</u></th> <th style="width:10%;"><u>FY 2001</u></th> <th style="width:10%;"><u>FY 2002</u></th> <th style="width:10%;"><u>FY 2003</u></th> <th style="width:10%;"><u>FY 2004</u></th> <th style="width:10%;"><u>FY 2005</u></th> <th style="width:10%;"><u>Cost to</u></th> <th style="width:10%;"><u>Total Cost</u></th> </tr> <tr> <td></td> <td align="center"><u>Actual</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Estimate</u></td> <td align="center"><u>Complete</u></td> <td></td> </tr> </thead> <tbody> <tr> <td>(U) Not Applicable</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>(U) <u>D. Acquisition Strategy</u></p> <p>These projects are in acquisition development and are accomplished through various prime contractors. The contracts are awarded competitively and follow the most recent DoD acquisition guidelines using the integrated product development philosophy.</p> <p>(U) <u>E. Schedule Profile</u></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:35%;"></th> <th colspan="4"><u>FY 1999</u></th> <th colspan="4"><u>FY 2000</u></th> <th colspan="4"><u>FY 2001</u></th> </tr> <tr> <td></td> <td align="center">1</td> <td align="center">2</td> <td align="center">3</td> <td align="center">4</td> <td align="center">1</td> <td align="center">2</td> <td align="center">3</td> <td align="center">4</td> <td align="center">1</td> <td align="center">2</td> <td align="center">3</td> <td align="center">4</td> </tr> </thead> <tbody> <tr> <td>(U) Horizontal Avionics Modernization Planning</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td align="center">X</td> <td align="center">X</td> <td align="center">X</td> </tr> <tr> <td>(U) Avionics Planning Baseline</td> <td align="center">*</td> <td align="center">*</td> <td align="center">*</td> <td align="center">*</td> <td align="center">*</td> <td align="center">X</td> </tr> <tr> <td>(U) Logistics/Initiative Planning</td> <td align="center">*</td> <td align="center">*</td> <td align="center">*</td> <td align="center">*</td> <td align="center">*</td> <td align="center">X</td> </tr> <tr> <td>(U) Tri-Service Standardization</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">X</td> <td align="center">X</td> <td align="center">X</td> <td align="center">X</td> </tr> </tbody> </table>											<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>		<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>		(U) Not Applicable											<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>					1	2	3	4	1	2	3	4	1	2	3	4	(U) Horizontal Avionics Modernization Planning									X	X	X	X	(U) Avionics Planning Baseline	*	*	*	*	*	X	X	X	X	X	X	X	(U) Logistics/Initiative Planning	*	*	*	*	*	X	X	X	X	X	X	X	(U) Tri-Service Standardization									X	X	X	X
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>																																																																																																												
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(U) Horizontal Avionics Modernization Planning									X	X	X	X																																																																																																									
(U) Avionics Planning Baseline	*	*	*	*	*	X	X	X	X	X	X	X																																																																																																									
(U) Logistics/Initiative Planning	*	*	*	*	*	X	X	X	X	X	X	X																																																																																																									
(U) Tri-Service Standardization									X	X	X	X																																																																																																									
Project 652257				Page 8 of 11 Pages				Exhibit R-2A (PE 0604201F)																																																																																																													

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	DATE February 2000
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BUDGET ACTIVITY 05 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development	PROJECT 652257
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(U) **E. Schedule Profile Continued**

	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) High-Speed Open Architecture--BUS Protocol				*	*	X	X	X	X	X	X	X

(U) * = Completed event

(U) X = Planned event

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000				
BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT			
05 - Engineering and Manufacturing Development				0604201F Integrated Avionics Planning and Development				652257			
(U) A. Project Cost Breakdown (\$ in Thousands)											
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>	
(U)	Avionics Planning Baseline					159		100		92	
(U)	Horizontal Avionics Modernization Planning					0		0		160	
(U)	Tri-Service Standardization					0		0		25	
(U)	Logistics / Initiative Planning and Support					55		130		140	
(U)	High-Speed Open Architecture--BUS Protocol					8		244		50	
(U)	Program Management Support					197		238		245	
(U)	Total					419		712		712	
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)											
(U) Performing Organizations:											
	<u>Contractor or Government Performing Activity</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>											
	Project EMD Contracts	Various	Annual 1 Oct	14,591	14,591	14,139	222	474	467	0	15,302
<u>Support and Management Organizations</u>											
	Program Mgmt Admin	Various	Annual 1 Oct	4,044	4,044	3,698	197	238	245	0	4,378
<u>Test and Evaluation Organizations</u>											
Not Applicable											
(U) Government Furnished Property:											
	<u>Item Description</u>	<u>Contract Method/Type or Funding Vehicle</u>	<u>Award or Obligation Date</u>	<u>Delivery Date</u>		<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
Project 652257											

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000		
BUDGET ACTIVITY 05 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604201F Integrated Avionics Planning and Development				PROJECT 652257	
(U) Government Furnished Property Continued:									
	<u>Contract</u>								
	<u>Method/Type</u>	<u>Award or</u>							
<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>	<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>	<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>									
Not Applicable									
<u>Support and Management Property</u>									
Not Applicable									
<u>Test and Evaluation Property</u>									
Not Applicable									
				<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Subtotals</u>				<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development				14,139	222	474	467	0	15,302
Subtotal Support and Management				3,698	197	238	245	0	4,378
Subtotal Test and Evaluation									
Total Project				17,837	419	712	712	0	19,680