

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
--	------------------------------

BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604239F F-22 EMD	PROJECT 4069
---	---	------------------------

COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4069 Advanced Tactical Fighter FSD	2,010,717	1,570,970	1,222,232	976,601	712,491	318,470			0	22,628,536*
Quantity of RDT&E Articles	1	0	4	3	0	0	0	0	0	

Unit cost of RDT&E articles not separately priced (NSP).

* Total Cost includes \$3,779,811,000 of Demonstration and Validation funding prior to FY 1992 funded in PE 0603230F.

** Quantity of RDT&E Articles includes one EMD flight test aircraft delivered in FY 1997.

(U) A. Mission Description

The F-22 is designed to penetrate enemy airspace and achieve a first look, first kill capability against multiple targets. The F-22 is characterized by a low observable, highly maneuverable airframe, advanced integrated avionics, and aerodynamic performance that allows supersonic cruise without the use of afterburner. The F-22 is currently in the Engineering and Manufacturing Development (EMD) phase of acquisition. Additionally, long lead production funding has been released for the two Production Representative Test Vehicle (PRTV) aircraft in FY 1998.

The EMD phase effort includes delivery of nine flight test vehicles and two ground test vehicles (static and fatigue); delivery of 26 flight qualified engines; integration and test of the EMD avionics suite including air-to-surface provision; development and test of the F-22 weapons system support and training system; and updating the YF-22 Avionics Flying Laboratory with EMD assets and software to become an avionics integration Flying Test Bed (FTB).

All OSD-level and 1998 congressional program criteria for F-22 flight test completed successfully ahead of schedule. The flight test criteria for PRTV full contract award were completed on 10 Oct 98, the software criteria for PRTV full contract awards were completed on 23 Nov 98. One hundred eighty-three (183) flight test hours were completed by 23 Nov 1998 this allowed the Air Force to award the Lot-1 advanced buy contract on 30 Dec 98. A successful review by the Defense Acquisition Executive was held on 17 Dec 98. The DAE authorized PRTV full contract award and authorized Lot-1 Advanced Buy contract award following release of SECRETARY OF DEFENSE/DIRECTOR OPERATIONAL TEST and EVALUATION Reports to Congress.

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
5 - Engineering and Manufacturing Development	0604239F F-22 EMD	February 1999 4069
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$1,185,714 Air Vehicle <ul style="list-style-type: none"> - Completed assembly of Engineering and Manufacturing Development (EMD) aircraft #2. (NSP) - Continued assembly of EMD aircraft #3. (NSP) - Initiated assembly of EMD aircraft #4-6. (NSP) - Continued systems installations on Flying Test Bed (FTB) (NSP) - Continued full scale pole model testing (NSP) - Continued flight test and flight test support (NSP) - (U) \$525,691 Avionics <ul style="list-style-type: none"> - Initiated Avionics Integration Laboratory (AIL) Block 1 integration (NSP) - Continued incorporating Avionics hardware into the FTB (NSP) - Continued DMS redesign activities for production incorporation (NSP) - Initiated FTB flight testing. (NSP) - (U) \$206,612 Engine <ul style="list-style-type: none"> - Continued production engine configuration development testing (NSP) - Continued to deliver and support two additional flight test engines (7 total) (NSP) - Continued verification of engine support system products (NSP) - Continued to build and test additional flight test engines (NSP) - (U) \$92,700 Other Government Cost <ul style="list-style-type: none"> - Initiated flight test and flight test support at Edwards AFB - Continued support of engine testing - Continued stores separation testing at Arnold Engineering Development Center - Continued sled test program at Holloman AFB - Continued aperture measurements at Rome Labs - Continued avionics ground testing at various government test facilities - Mission support of the SPO; travel, computer costs, misc contracts, etc. - Procurement of required government furnished equipment (GFE) - Continued Live Fire testing at Air Force Research Labs - (U) \$2,010,717 Total 		
Project 4069	Page 2 of 11 Pages	Exhibit R-2 (PE 0604239F)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
	0604239F F-22 EMD	4069
<p>(U) _____:</p> <p>- Air Vehicle</p> <ul style="list-style-type: none"> - Continue assembly of EMD aircraft #3-6. (NSP) - Initiate static test. (NSP) - Initiate fatigue tests. (NSP) <p>- Continue flight test and flight test support (NSP)</p> <p>(U) \$473,531</p> <ul style="list-style-type: none"> - Initiate AIL integration in preparation of Block 2 integration testing (NSP) - Initiate delivery and installation of avionics hardware on the first avionics test aircraft (NSP) - Complete (AIL) Block 1.0 integration (NSP) - Continue DMS redesign, requalification and retesting activities (NSP) <p>- Engine</p> <ul style="list-style-type: none"> - Continue to deliver and support six additional flight test engines (13 total). (NSP) - Continue verification of engine support system products (NSP) - Continue building and test additional flight test engines (NSP) <p>- (U) \$97,700 Other Government Cost</p> <ul style="list-style-type: none"> - Continue support of engine testing - Continue aperture measurements at Rome Labs - Mission support of the SPO; travel, computer costs, misc contracts, etc. - Procurement of required GFE - Continue live fire testing at Air Force Research Labs - Continue stores separation testing at AEDC <p>- Total</p>		
Project 4069	Exhibit R-2 (PE 0604239F)	

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
5 - Engineering and Manufacturing Development	0604239F F-22 EMD	4069
<p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U) \$689,694 Air Vehicle <ul style="list-style-type: none"> - Complete static test (NSP) - Conduct First Flight Readiness Review for aircraft #4. (NSP) - Complete assembly of EMD aircraft #3-6 (NSP) - Continue assembly of EMD aircraft #7-9 (NSP) - Complete final production readiness review (NSP) - Continue flight test and flight test support (NSP) - Complete full scale pole model testing (RCS). (NSP) - Complete first lifetime fatigue test (NSP) - (U) \$275,827 Avionics <ul style="list-style-type: none"> - First flight of the first avionics test aircraft (NSP) - Initiate AIL Block 3 integration (NSP) - Continue incorporating avionics software/hardware into the FTB (NSP) - Continue DMS redesign activities for production incorporation (NSP) - Initiate avionics software block 3S flight testing (NSP) - Initiate Block 3 FTB testing (NSP) - (U) \$140,111 Engine <ul style="list-style-type: none"> - Continue production engine configuration development testing (NSP) - Continue to deliver and support thirteen additional flight test engines (26 total) (NSP) - Continue verification of engine support system products (NSP) - Continue to build and test additional flight test engines (NSP) - (U) \$116,600 Other Government Cost <ul style="list-style-type: none"> - Continue flight test and flight test support at Edwards AFB - Continue support of engine testing at AEDC - Continue aperture measurements at Rome Labs - Continue avionics ground testing at various government facilities - Mission support of the SPO; travel, computer costs, misc contracts, etc. - Procurement of required GFE - Continue sled test program at Holloman AFB - Continue live fire testing at Air Force Research Labs - (U) \$1,222,232 Total 		
Project 4069	Page 4 of 11 Pages	Exhibit R-2 (PE 0604239F)

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

February 1999

BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

0604239F F-22 EMD

(U) _____

- (U) \$582,164
 - Complete assembly of EMD aircraft #7-9. (NSP)
 - Continue flight test and flight test support. (NSP)

- (U) \$184,599
 - Initiate AIL Block 3.1 integration. (NSP)
 - Complete flight testing on the Block 3.1 FTB. (NSP)

- - Continue DMS redesign, requalification and retesting activities. (NSP)
- Engine
 - Continue production engine configuration development testing. (NSP)

- - Continue to build and test additional flight test engines. (NSP)
- Other Government Cost
 - Continue engine testing at AEDC
 - Continue avionics ground testing at various government facilities

- - Procurement of required GFE
 - Continue live fire testing at Air Force Research Labs
- Total

(U) **B.** _____

This program is in Budget Activity 5, Engineering and Manufacturing Development, because the F-22 Program is developing the next-generation air superiority fighter for the USAF to counter emerging worldwide threats.

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
--	------------------------------

BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604239F F-22 EMD	PROJECT 4069
--	--	-------------------------------

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

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 1999 PB)	1,958,915	1,582,217	1,204,490	995,191	22,663,988
(U) Appropriated Value	2,077,234	1,575,417			
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions	-68,250	-4,447			
b. SBIR	-50,352				
c. Omnibus or other Above Threshold Reprogramming	60,202				
d. BTR	-8,117				
(U) Adjustments to Budget Years Since FY 1999 PB			17,742	-18,590	
(U) Current Budget Submit/FY 2000 PB	2,010,717	1,570,970	1,222,232	976,601	22,628,536

(U) Significant Program Changes:

- The FY 1998 Appropriations Act transferred \$73.531M from FY97 Procurement (3010) to FY97 RDT&E (3600) to support redesign activities associated with Out-of-Production Parts (OPP). OSD transferred the \$73.531M from FY97 RDT&E (3600) to FY98 RDT&E (3600) to ensure the Air Force maintained the full two fiscal year term to obligate the funds.

- \$40,000 in FY 2000 includes a payback of a FY 1998 cut to Air Combat Simulator and funding to support Air Combat Command Block IV requirements for IOC (Helmet-mounted sight, AIM-9X, Project 3308 and Advanced Combat ID).

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
--	------------------------------

5 - Engineering and Manufacturing Development	4069
--	-------------

Other Program Funding Summary (\$ in Thousands)

	<u>FY 1998</u>		<u>FY 2000</u>	<u>FY 2001</u>		<u>FY 2003</u>	<u>FY 2004</u>	<u>_____</u>	<u>To Complete</u>	<u>Cost</u>
(U) F-22 Squadrons (PE 0207138F)								*82,953	*TBD	
(U) Military Construction (PE 0604239F)	0		4,388	13,410		0	0		0	**38,829
	0	0		24,033	0		0	0		197,533
(U) Aircraft Procurement (PE 0207219F)	73,291		1,858,137	2,551,432		4,326,385	3,988,135		20,071,464	40,271,547
#003										
	0		1,398	2,747		6,455	9,587		58,404	92,938
(PE 0207219F)										

0207138F includes manpower authorizations, peculiar and common support equipment, necessary facilities and the associated costs specifically identified and measurable to the following: Operation, maintenance, and logistical support of the F-22 fighter aircraft. Excludes advanced flying training operation costs and base and

** Includes 21,040 of FY 1997 & prior funds.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 1999
--	------------------------------

BUDGET ACTIVITY 5 - Engineering and Manufacturing Development	PE NUMBER AND TITLE 0604239F F-22 EMD	PROJECT 4069
--	--	-------------------------------

(U) **E. Acquisition Strategy:** The EMD contract is Cost Plus Award Fee with Lockheed Martin Aeronautical Systems (LMAS) to produce the F-22 air vehicle and Pratt & Whitney (P&W) to produce the F119 engines. The engines are provided to LMAS as GFE.

(U) **F. Schedule Profile**

	FY 1998			FY 1999			FY 2000			FY 2001		
(U) Aircraft Delivered (EMD Test Article)	1	2	3	4	1	2	3	4	1	2	3	4
			*						X	X	2	
										X		

Program Milestones

- Program Review, PRTV Award, Lot 1 LL
- DAB MS III, 4QFY03

*

Engineering Milestones

- Final PRR
- First Avionics Flight

X

X

T&E Milestones

- Dedicated IOT&E, 4QFY02

EMD = Engineering & Manufacturing Development, DAB = Defense Acquisition Board, LRIP = Low Rate Initial Production, LL = Long Lead, MS = Milestone, DT&E = Developmental Test & Evaluation, IOT&E = Initial Operational Test & Evaluation

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

February 1999

BUDGET ACTIVITY

PE NUMBER AND TITLE

PROJECT

0604239F F-22 EMD

(U) A. Project Cost Breakdown (\$ in Thousands)

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
(U) Air Vehicle/Avionics	1,711,405	1,300,166	965,521	766,763
(U) Engine	206,612	173,104	140,111	54,638
(U) Government Cost				
- Government Test	68,600	78,500	99,400	139,200
- Mission Support	12,500	11,500	11,000	10,700
- HAZMAT	0	1,000	800	800
- GFE	11,600	6,700	5,400	4,500
(U) Total	2,010,717	1,570,970	1,222,232	976,601

(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)

Performing Organizations:

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
---	--	--------------------------------	-------------------------------	--------------------------	------------------------------	-------------------	-------------------	-------------------	-------------------	-----------------------	------------------

Product Development Organizations

Lockheed (Air Veh)	C/CPAF	Aug 91	12,816,155	15,295,391	9,825,200	1,711,405	1,300,166	965,521	766,763	739,836	15,308,891
Pratt & Whitney	C/CPAF	Aug 91	2,197,900	2,472,734	1,830,944	206,612	173,104	140,111	54,638	67,325	2,472,734

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development					PE NUMBER AND TITLE 0604239F F-22 EMD					PROJECT 4069	
<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 1998</u>	<u>Budget FY 1998</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>Support and Management Organizations</u>											
Support Contracts	Various	Various	N/A	N/A	10,155	2,247	3,303	2,600	2,300	1,500	22,105
In House Support	Various	Various	N/A	N/A	72,045	10,253	9,197	9,200	9,200	17,500	127,395
<u>Test and Evaluation Organizations</u>											
AEDC	PO		N/A	N/A	*135,833	19,175	12,250	10,100	100	0	177,458
AFFTC	PO		N/A	N/A	*103,842	44,666	52,700	76,100	113,500	195,900	586,708
All Other Tests	Various	Various	N/A	N/A	*26,825	4,759	13,550	13,200	25,600	8,900	92,834
<p>Note: The Project Office EAC includes the following items not included in the Performing Activity (i.e., Contractor) EAC - Base Fee, Award Fee, SPO Planned CCPs not yet on contract, and other adjustments based on results of the restructured program.</p> <p>* Total Prior to FY 1998 (Actuals) for Test and Evaluation Organizations have been restated to account for bookkeeping changes across the activities.</p>											
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 1998</u>	<u>Budget FY 1998</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>											
GFE	Various	Various	Various		32,400	11,600	6,700	5,400	4,500	0	60,600
<u>Support and Management Property</u>											
Project 4069											

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 1999		
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604239F F-22 EMD				PROJECT 4069		
<u>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 1998</u>	<u>Budget FY 1998</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>
Not Applicable										
<u>Test and Evaluation Property</u>										
Not Applicable										
Subtotal Product Development				11,656,144	1,918,017	1,473,270	1,105,632	821,401	807,161	781,625
Subtotal Support and Management				114,600	24,100	19,200	17,200	16,000	19,000	210,100
Subtotal Test and Evaluation				266,500	68,600	78,500	99,400	139,200	204,800	857,000
Total Project				12,037,244	2,010,717	1,570,970	1,222,232	976,601	1,030,961	*18,848,725
* Total Program cost does not include \$3,779,811 of Demonstration and Validation funding prior to FY 1992 funded in PE 0603230F.										