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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000			
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305110F Satellite Control Network				PROJECT 673276			
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	
673276	Satellite Control Network	45,343	60,977	56,643	97,504	41,450	32,640	33,657	Continuing	TBD	
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	
<p>(U) <u>A. Mission Description</u></p> <p>The Air Force Satellite Control Network (AFSCN) mission is to fly operational USAF and other DoD satellites. The AFSCN also provides launch and early orbit tracking operations in support of all major US launches. Air Force Space Command (AFSPC) performs operations and maintenance and Air Force Materiel Command (AFMC) performs modernization and sustainment of the system to meet requirements validated by a HQ USAF approved Operational Requirements Document (ORD). This program element contains funds for the development and acquisition of this integrated national satellite telemetry, tracking, commanding, and data relay capability to meet the requirements of the growing inventory of operational and developmental DoD, National, Civil, and Allied satellite systems. Improvement and Modernization efforts in command & control, communications, and range elements of the AFSCN will ensure DoD space systems are operationally ready to support the CINCs' warfighting requirements.</p> <p>The AFSCN is a global infrastructure of control centers, remote tracking stations (RTSs), and communications links that provide the highly reliable command and control, communications, and range systems required to support the nation's surveillance, navigation, communications, and weather satellite operations. The AFSCN is the DoD common user network that provides satellite state-of-health, tracking, telemetry, and commanding (TT&C) for the following operational satellite systems: Defense Meteorological Satellite Program (DMSP), Global Positioning System (GPS), Defense Satellite Communications System (DSCS), Defense Support Program (DSP), Fleet Satellite (FLEETSAT), Military Strategic and Tactical Relay Satellite (MILSTAR), the Navy's Ultra High Frequency Follow-On (UHF F/O), Skynet, NATO III/IV, and classified programs.</p> <p>AFSCN Improvement and Modernization (I&M): AFSCN I&M is an ongoing program of replacements and upgrades which will replace non-standard, unsupportable equipment with more reliable, maintainable and standardized hardware and software. This new equipment will enable AFSPC satellite operations to be performed with fewer, less skilled personnel and will significantly reduce hardware/software maintenance costs. The principal efforts within this program are: Network Operations Upgrades, Communications Upgrades, and Range Upgrades.</p> <p>NETWORK OPERATIONS UPGRADES: The current manpower intensive scheduling system to deconflict and allocate network TT&C assets to support operational space vehicles was replaced with Electronic Schedule Dissemination (ESD), a Year 2000-compliant system which performs network resource scheduling. The Orbit Analysis Subsystem (OAS) is a Year 2000-compliant replacement of the collision avoidance functions currently residing at Onizuka AS. The OAS will be installed at</p>											
Project 673276				Page 1 of 7 Pages				Exhibit R-2 (PE 0305110F)			

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(U) <u>A. Mission Description Continued</u>		
Schriever AFB CO. Both the ESD and OAS offer the potential for reducing satellite control O&M costs through enhanced commonality and standardization, simplified operations, and automation. Commercial off-the-shelf (COTS) hardware and software will be procured for the upgrades. The software portions will be modified to meet AFSPC's operational requirements.		
<p>COMMUNICATIONS UPGRADES: This effort will transition the current, costly point-to-point AFSCN communications network to a communications grid system that integrates government and commercial networks as technology becomes available. Several standardization efforts are being implemented to improve and modernize the communications and ground segment elements of the AFSCN, including: Archival recording systems to replace obsolete, manpower-intensive analog equipment with automated, standardized digital COTS systems; Wide Area Network Interface Units (WANIU) which standardize hardware and reduce O&M costs for performing multiplexing functions in the AFSCN, as well as provide an Asynchronous Transfer Mode (ATM) interface; and Operational Switch Replacement (OSR) to provide increased capacity, reliability, data quality, and user access.</p>		
<p>RANGE UPGRADES: This effort will upgrade the current Automated Remote Tracking Station (ARTS) and other Range assets. Several integrated projects will standardize the remote tracking stations, upgrade and/or replace outdated equipment in order to reduce failures, correct operational deficiencies, and reduce operating and sustainment costs.</p>		
(U) <u>FY 1999 (\$ in Thousands)</u>		
(U) \$2,000	Network Operations Upgrades: completed development of ESD/Automated Scheduling Tool for Range Operations (ASTRO) and the OAS.	
(U) \$30,692	Communications Upgrades: continued developing Archival Recorder System; continued developing Operational Switch Replacement; supported WANIU installation at RTSs and Operational Control Nodes (OCNs).	
(U) \$12,651	Network Integration and Systems Engineering: continued system engineering and integration of hardware/software to meet evolving satellite program requirements at OCNs and Remote Tracking Stations (RTSs).	
(U) \$45,343	Total	
(U) <u>FY 2000 (\$ in Thousands)</u>		
(U) \$5,164	Network Operations Upgrades: begin OAS follow-on development to continue to upgrade the radio frequency interference (RFI) capabilities.	
(U) \$31,228	Communications Upgrades: continue OSR development; complete WANIU and archival recorders.	
(U) \$15,478	Range Upgrades: begin Control and Status (C&S) Processor Upgrade development to continue the ARTS modernization effort; as a continuation of the modernization effort to standardize hardware and software, begin Standards Protocol requirements definition effort to address impact on AFSCN architecture of emerging space communications protocols being examined by DOD, NASA, and the International Standards Organization.	
(U) \$9,107	Network Integration and Systems Engineering: continue system engineering and integration of hardware/software to meet evolving satellite	
Project 673276	Page 2 of 7 Pages	Exhibit R-2 (PE 0305110F)

UNCLASSIFIED

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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT			
07 - Operational System Development	0305110F Satellite Control Network	673276			
(U) <u>A. Mission Description Continued</u>					
(U) <u>FY 2000 (\$ in Thousands) Continued</u>					
	program requirements at OCNs and RTSs.				
(U) \$60,977	Total				
(U) <u>FY 2001 (\$ in Thousands)</u>					
(U) \$2,374	Network Operations Upgrades: complete development of OAS follow-on capability.				
(U) \$24,171	Communications Upgrades: complete OSR development; begin Defense Information System Network (DISN)-ATM connectivity development to continue communications upgrade efforts and to enable external users to connect to the AFSCN through DISN.				
(U) \$20,266	Range Upgrades: continue Standards Protocol development; continue C&S Processor Upgrade development; begin effort to upgrade the Automated Remote Tracking Stations (ARTS) Space/Ground interface upgrade as a continuation of the ARTS modernization effort.				
(U) \$9,832	Network Integration and Systems Engineering: continue system engineering and integration of hardware/software to meet evolving satellite program requirements at OCNs and RTSs.				
(U) \$56,643	Total				
(U) <u>B. Budget Activity Justification</u>					
	This effort is in Budget Activity 7, Operational System Development, because it supports a fielded system.				
(U) <u>C. Program Change Summary (\$ in Thousands)</u>					
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 2000 PBR)		55,812	61,918	85,064	TBD
(U) Appropriated Value		56,622	61,918		
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions		-810	-123		
b. Small Business Innovative Research		-1,885			
c. Omnibus or Other Above Threshold Reprogram			-335		
d. Below Threshold Reprogram		-8,330			
e. Rescissions		-254	-483		
f. Other					TBD
(U) Adjustments to Budget Years Since FY 2000 PBR				-28,421	
(U) Current Budget Submit/FY 2001 PBR		45,343	60,977	56,643	TBD

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305110F Satellite Control Network	PROJECT 673276
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(U) **C. Program Change Summary (\$ in Thousands) Continued**

(U) **Significant Program Changes:**

FY99: Resource Management System (RMS) was restructured and descoped to provide AFSCN scheduling upgrades via the Electronic Schedule Dissemination (ESD) solution, and to provide collision avoidance functions at Schriever AFB through the Orbit Analysis Subsystem (OAS) solution. Antenna upgrade development funds were used for higher Air Force priorities, with antenna improvements now planned to be accomplished through a procurement-funded replacement program.

FY01: A reduction of \$9,400 was due to underexecution in FY99 and expected excess carry-forward through FY00, and into FY01. A \$7,300 adjustment properly aligned funds to OPAF to purchase hardware for the OAS follow-on project. A reduction of \$11,200 delayed the asset consolidation and the resource scheduling upgrade by one year.

(U) **D. 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) Other Procurement, AF; Budget Activity: 03; P-65; AFSCN	22,349	31,314	39,094	39,750	34,329	37,533	32,501	Continuing	TBD

(U) **E. Acquisition Strategy**

The primary objective of the AFSCN I&M program is to reduce the cost of satellite control operations while maintaining or improving reliability, maintainability, operability, and capability of current systems. A combination of performance-based specifications and commercial/industrial specifications and standards was used for these acquisitions and was tailored to state only the Government's minimum performance needs. All development contracts were competitively awarded and utilized commercial practices and streamlining to the maximum extent possible. Starting in FY96, a new streamlined contracting strategy was implemented with the award of three new contracts. This strategy resulted in the Range & Communications Development Contract (RCDC), the Network Operations Upgrade Contract (NOUC), and the Network Integration Contract (NIC). Integration efforts had previously been spread across functional and contracting lines; but with the new AFSCN contracting strategy, the NIC contractor was given responsibility for inter-segment integration. Development upgrades are being designed to be flexible in meeting new satellite program requirements while minimizing sustainment costs by taking advantage of development efforts in satellite control over a large number of government and non-government development activities. These objectives can best be reached by developing systems with an open software design and a distributed system architecture using COTS products wherever feasible.

(U) **F. Schedule Profile**

<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
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RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
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BUDGET ACTIVITY 07 - Operational System Development	PE NUMBER AND TITLE 0305110F Satellite Control Network	PROJECT 673276
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(U) **F. 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) Network Operations Upgrades												
(U) - ESD DD-250				*								
(U) Communications Upgrades												
(U) - RTS archival installation initiation					*							
(U) - Archival DD-250								X				
(U) - WANIU Functional/Physical Configuration Audit (FCA/PCA)		*										
(U) - WANIU DD-250									X			
(U) - OSR Incremental Demonstration Review-1				*								
(U) - OSR Incremental Demonstration Review-2							X					
(U) - OSR FCA/PCA											X	
(U) - Begin External User DISN-ATM Connectivity											X	
(U) Range Upgrades												
(U) - Start Control and Status Upgrade							X					
(U) - Begin ARTS upgrade											X	
* = completed; X = planned												

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)								DATE February 2000		
BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305110F Satellite Control Network				PROJECT 673276		
(U) A. Project Cost Breakdown (\$ in Thousands)										
						<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
(U)	Network Ops Upgrades (Command and Control Upgrades)					2,000		5,164		2,374
(U)	Communications Upgrades					30,692		31,228		24,171
(U)	Range Upgrades					0		15,478		20,266
(U)	Network Integration and Systems Engineering					12,651		9,107		9,832
(U)	Total					45,343		60,977		56,643
(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)										
(U) Performing Organizations:										
<u>Contractor or Government</u>	<u>Contract Method/Type</u>	<u>Award or Obligation</u>	<u>Performing Activity</u>	<u>Project Office</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>Performing Activity</u>	<u>or Funding Vehicle</u>	<u>Date</u>	<u>EAC</u>	<u>EAC</u>						
<u>Product Development Organizations</u>										
Multiple	Multiple	Multiple	72,296	72,296	72,296	0	0	0	0	72,296
Lockheed Martin	C/CPAF	Mar 96	143,737	143,737	40,318	30,692	46,706	14,771	11,250	143,737
Lockheed Martin	C/CPAF	Apr 96	50,323	50,323	43,159	2,000	5,164	0	0	50,323
AFSCN Upgrades	TBD	Nov 00	TBD	TBD	0	0	0	32,040	Continuing	TBD
Lockheed Martin	C/CPAF	May 96	64,343	64,343	19,900	12,651	9,107	9,832	12,853	64,343
<u>Support and Management Organizations</u>										
N/A										
<u>Test and Evaluation Organizations</u>										
N/A										
(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>

UNCLASSIFIED

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BUDGET ACTIVITY 07 - Operational System Development				PE NUMBER AND TITLE 0305110F Satellite Control Network			PROJECT 673276		
(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>									
N/A									
<u>Support and Management Property</u>									
N/A									
<u>Test and Evaluation Property</u>									
N/A									
				<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				175,673	45,343	60,977	56,643	TBD	TBD
Subtotal Support and Management									
Subtotal Test and Evaluation									
Total Project				175,673	45,343	60,977	56,643	TBD	TBD