

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

BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems
---	---

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
Total Program Element (PE) Cost	2,330	2,176	2,864	2,892	2,931	2,981	3,043	3,107	Continuing	TBD
1013 Theater Deployable Communications (TDC)	2,141	1,975	2,646	2,672	2,931	2,981	3,043	3,107	Continuing	TBD
2982 Anti-Jam Radio Communications	189	201	218	220	0	0	0	0	0	20,021
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Descriptions

The Advanced Communication Systems program procures commercially available ground communications equipment for deployment to theaters of operation; and develops and procures jam-resistant, ultra high frequency (UHF) and very high frequency (VHF) frequency-hopping tactical radios. The HAVE QUICK UHF radios provide the primary Air Force and DOD UHF Electronic Counter-Countermeasures (ECCM) voice communications. SINCGARS (Single Channel Ground and Airborne Radio System) provides anti-jam, VHF frequency-hopping voice and data communications and is the primary means of ECCM communications between Air Force, Army, and USMC aircraft and ground units involved in close air support and joint battlefield operations. The Theater Deployable Communications (TDC) program provides funding for the research, development, test and evaluation for the modernization of operational deployable communications, and integration of commercial off the shelf (COTS) equipment that support tactical air operations in a combat environment. This includes the integration of deployable communications equipment for active duty, guard and reserve forces. Equipment will be fielded at wings, combat communications squadrons, Air Force Special Operations Command and Air Mobility Command communication units, and Theater Air Control System units.

(U) B. Budget Activity Justification

This program is budget activity 7, Operational System Development because RDT&E funds in this program element are used to examine appropriate emerging technologies; provide software development support for the fielded HAVE QUICK family of radios; and determine and resolve integration issues pertaining to commercial-off-the-shelf (COTS) equipment.

UNCLASSIFIED

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

BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems
--	--

(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) FY1999 President's Budget	2,728	2,348	2,916	2,947	TBD
(U) Appropriated Value	2,966	2,348			
(U) Adjustments to Appropriated Value					
a. Congressional Reductions	-174	-172			
b. SBIR	-64				
c. Omnibus and Other AboveThreshold Reprogramming	-18				
d. Below Threshold Reprogramming	-380				
Adjustment to Budget Years Since FY 1999 President Budget			-52	-55	
(U) Current Budget Submit /FY 2000 PB	2,330	2,176	2,864	2,892	TBD

(U) Significant Program Changes:
 FY99: \$67 identified as a sources for SBIR

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999		
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207423F Advanced Communications Systems				PROJECT 1013		
<i>COST (\$ In Thousands)</i>	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
1013 Theater Deployable Communications (TDC)	2,141	1,975	2,646	2,672	2,931	2,981	3,043	3,107	Continuing	TBD
<p>(U) A. <u>Mission Description</u></p> <p>As clearly demonstrated during Desert Shield/Desert Storm (DS/DS), today's generation of deployable communications equipment is bulky, inflexible in design and does not meet today's projected airlift availability or interoperability standards. Air Force planning calls for initial communications assets to be in place prior to the arrival of flying forces. Deployment priorities for DS/DS did not allow timely arrival of communications assets. This program will complete joint interoperability certification testing, begin development and implementation of integrated network management software, and support field activities and conduct integration activities. This program also emphasizes COTS equipment to augment existing assets or replace tactical communications packages. The resulting Theater Deployable Communications (TDC) packages will reduce airlift requirements and be designed to support a wide range of operational scenarios during deployment/employment, expansion and sustaining operations. Communications packages will be used by theater air control, combat communications, special operations units, deployed air wings, and mobility forces worldwide.</p>										
Project 1013			Page 3 of 13 Pages				Exhibit R-2A (PE 0207423F)			

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE
BUDGET ACTIVITY		PROJECT
7 - Operational System Development	0207423F Advanced Communications Systems	February 1999 1013
<p>(U) <u>FY 1998 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U)\$ 427 Continue communications architecture planning - (U)\$ 505 Continue development of automation tools - (U)\$ 891 Continue field interoperability and integration activities - (U)\$ 318 Start production improvement and interface development - (U)\$ 2,141 Total <p>(U) <u>FY 1999 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U)\$ 299 Continue communications architecture planning - (U)\$ 430 Continue development of automation tools - (U)\$ 885 Continue field interoperability and integration activities - (U)\$ 300 Continue production improvement and interface development - (U)\$ 61 Identified as a source for SBIR - (U)\$ 1,975 Total <p>(U) <u>FY 2000 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U)\$ 378 Continue communications architecture planning - (U)\$ 619 Continue development of automation tools - (U)\$ 1,233 Continue field interoperability and integration activities - (U)\$ 416 Production improvement and interface development - (U)\$ 2,646 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U)\$ 382 Continue communications architecture planning - (U)\$ 626 Continue development of automation tools - (U)\$ 1,244 Continue field interoperability and intergration activities - (U)\$ 420 Production improvement and interface development 		
Project 1013	Page 4 of 13 Pages	Exhibit R-2A (PE 0207423F)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)								DATE February 1999			
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207423F Advanced Communications Systems			PROJECT 1013			
- (U)\$ 2,672 Total											
<p>(U) B. <u>Project Change Summary - Description of Significant Changes:</u> N/A</p>											
<p>(U) C. <u>Other Program Funding Summary (\$ in Thousands)</u></p>											
		<u>FY 1998</u>	<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>	To <u>Compl</u>	Total <u>Cost</u>
(U) Other Procurement AF, Budget Activity 3, PE 0207423F		27,150	33,874	36,401	88,168	77,961	126,778	158,978	121,463	Cont.	TBD
(U) Other Procurement AF, Budget Activity 5, Weapon System Code 86190A, PE 0207423F,		4,556	1,888	1,348	3,048	98	97	99	101	Cont.	TBD
<p>(U) D. <u>Acquisition Strategy:</u> There are two Firm Fixed Price (FFP) contracts for Theater Deployable Communications (TDC): Lightweight Multiband Satellite Terminals (LMST) and the Integrated Communication Access Package (ICAP). The TDC contracts were awarded after full and open competitions. (When restricted technologies are involved, foreign competition is not allowed.)</p>											
Project 1013		Page 5 of 13 Pages				Exhibit R-2A (PE 0207423F)					

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999					
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207423F Advanced Communications Systems				PROJECT 1013				
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>												
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>					
(U)	Software Support			902	713	994	1,002					
(U)	Engineering Support			400	256	370	376					
(U)	Integration Activities			769	880	1,194	1,204					
(U)	Travel			55	55	76	77					
(U)	Miscellaneous			15	10	12	13					
(U)	Identified as a source for SBIR				61							
(U)	Total			2,141	1,975	2,646	2,672					
(U) B. <u>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 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>
	Identified as a source for SBIR							61				
<u>Product Development Organizations</u>												
	Various					3,567	756	560	804	813	Cont	Cont
<u>Support and Management Organizations</u>												
	MITRE	FFP	OCT 97	TBD	TBD	3,669	890	915	1,000	1,000	Cont	Cont
	TEMS	FFP	Varies			964	495	439	842	859	Cont	Cont
Project 1013				Page 7 of 13 Pages				Exhibit R-3 (PE 0207423F)				

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY 7 - Operational System Development					PE NUMBER AND TITLE 0207423F Advanced Communications Systems					PROJECT 2982	
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
<u>Test and Evaluation Organizations</u>											
Government Furnished Property: Not Applicable											
Identified as source for SBIR							61				
Subtotal Product Development					3,567	756	560	804	813	Cont	Cont
Subtotal Support and Management					4,633	1,385	1,354	1,842	1,859	Cont	Cont
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					8,200	2,141	1,975	2,646	2,672	Cont	Cont

UNCLASSIFIED

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

BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems	PROJECT 2982
--	--	------------------------

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
2982 Anti-Jam Radio Communications	189	201	218	220	0	0	0	0	0	20,021

(U) A. Mission Description

The fast paced development of new frequency hopping radio technologies by potentially hostile nations dictates that the U.S. maintains a technological lead. Ultra high frequency (UHF) frequency hopping voice radios are needed for jam resistant communications between tactical aircraft and airborne and ground control elements. The HAVE QUICK wave form used in these radios is the NATO standard for UHF anti-jam communications. The HAVE QUICK UHF radios provide the primary Air Force and DOD UHF Electronic Counter-Countermeasures (ECCM) voice communications. SINGARS (Single Channel Ground and Airborne Radio System) provides anti jam, very high frequency (VHF) frequency hopping radios and data communications and is the primary means of ECCM communications between Air Force, Army, USMC aircraft and ground units involved in close air support and joint battlefield operations.

(U) FY 1998 (\$ in Thousands):

- (U)\$ Continue to investigate improvements in anti-jam performance and other anti-jam techniques
89
- (U)\$ 100 Begin to investigate decrease in air traffic control channel bandwidth and modulation techniques
- (U)\$ 189 Total

(U) FY 1999 (\$ in Thousands):

- (U)\$ Continue to investigate improvements in anti-jam performance and other anti-jam techniques
90
- (U)\$ 105 Continue to investigate decrease in air traffic control channel bandwidth and modulation techniques
- (U)\$ 6 Identified as source for SBIR
- (U)\$ 201 Total

(U) FY 2000 (\$ in Thousands):

- (U)\$ Continue to investigate improvements in anti-jam performance and other anti-jam techniques
110

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 1999
BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems	PROJECT 2982
<ul style="list-style-type: none"> - (U)\$ 108 Investigate decrease in air traffic control channel bandwidth and modulation techniques - (U)\$ 218 Total <p>(U) <u>FY 2001 (\$ in Thousands):</u></p> <ul style="list-style-type: none"> - (U)\$ 100 Continue to investigate improvement in anti-jam performance and other anti-jam techniques; including feasibility of converting algorithms from hardware to software - (U)\$ 120 Investigate decrease in air traffic control channel bandwidth and modulation techniques including Time Division Multiple Access (TMDA) prototype development and testing - (U)\$ 220 Total <p>(U) B. Budget Activity Justification: This program is budget activity 7, Operational System Development because RDT&E funds in this program element are used to examine appropriate emerging technologies; provide software development support for the fielded HAVE QUICK family of radios; and the AN\ARE-777 (SINCGARS) radio; determine and resolve integration issues pertaining to commercial-off-the-shelf (COTS) equipment.</p>		
Project 2982	Page 10 of 13 Pages	Exhibit R-2A (PE 0207423F)

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

BUDGET ACTIVITY 7 - Operational System Development	PE NUMBER AND TITLE 0207423F Advanced Communications Systems	PROJECT 2982
--	--	------------------------

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

	<u>FY 1998</u>	<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>To</u> Compl	<u>Total</u> Cost
(U) Other Procurement AF, Budget Activity 3, Weapon System Code 837100, PE 0207423F	3,530	0	13,309	22,169	23,628	24,003	12,777	9,703	Cont	TBD

(U) **D. Acquisition Strategy:**

The Anti-Jam (SINCGARS) project is a FFP contract that was awarded after full open competition

(U) **E. Schedule Profile**

	<u>FY 1998</u>			<u>FY 1999</u>			<u>FY 2000</u>			<u>FY 2001</u>		
(U) SINCGARS Phase II Qual Testing	1	2	3	4	1	2	3	4	1	2	3	4
(U) Investigate anti-jam improvements			*								X	
(U) Analyze decrease in ATC bandwidth												X

* denotes completed event

X denotes planned event

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Development				PE NUMBER AND TITLE 0207423F Advanced Communications Systems				PROJECT 2982			
(U) A. <u>Project Cost Breakdown (\$ in Thousands)</u>											
				<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>				
(U) a.	Software Support			49	50	50	50				
(U) b.	Engineering Support			28	30	30	26				
(U) c.	Evaluation Analysis			73	66	80	82				
(U) d.	Test and Evaluation			25	15	21	25				
(U) e.	Travel			14	20	20	20				
(U) f.	R&D Centers Payments			0	0	0	0				
(U) h.	Identified as a source SBIR.				6						
(U) g.	Miscellaneous			0	14	17	17				
(U)	Total			189	201	218	220				
(U) B. <u>Budget Acquisition History and Planning Information (\$ in Thousands)</u>											
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
Identified as a source for SBIR							6				
<u>Product Development Organizations</u>											
N/A											
<u>Support and Management Organizations</u>											
MITRE	FFP	OCT 97	TBD	TBD	234	119	115	130	134	0	732
TEMS	FFP	Varies			18,935	70	80	88	86	0	19,259

UNCLASSIFIED

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE February 1999	
BUDGET ACTIVITY					PE NUMBER AND TITLE					PROJECT	
7 - Operational System Development					0207423F Advanced Communications Systems					2982	
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
<u>Test and Evaluation Organizations</u>											
AFOTEC	N/A										
Government Furnished Property: Not Applicable											
Identified as a source for SBIR							6				
Subtotal Product Development											
Subtotal Support and Management					19,169	189	195	218	220	0	20,021
Subtotal Test and Evaluation					0	0	0	0	0	0	0
Total Project					19,169	189	201	218	220	0	19,997

THIS PAGE INTENTIONALLY LEFT BLANK