

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)									DATE February 1997	
BUDGET ACTIVITY 2 - Applied Research				PE NUMBER AND TITLE 0602173C Support Technologies - Applied Research						
COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	96,092	102,510	101,932	95,488	86,025	82,161	78,543	78,411	Continuing	Continuing
1651 Innovative Science and Technology (IST)	47,852	56,009	50,923	50,094	43,774	41,411	42,505	43,506	Continuing	Continuing
1660 Statutory and Mandated Programs	48,240	46,501	51,009	45,394	42,251	40,750	36,038	34,905	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

To prepare to meet critical future active defense needs, advanced technology programs invest in an aggressive program of high leverage technologies that yield markedly improved capabilities across a selected range of boost phase and terminal defense interceptors, advanced target sensors, and innovative science. The objectives of these investments are to provide: (1) component technologies that offer improved performance or reduced costs for BMDO acquisition programs; (2) a better understanding of the physical processes to support these acquisition programs; and (3) technical solution options to mitigate unpredicted threats. Unlike other BMDO projects that fund near term technology and testing efforts, this advanced technology initiative invests seed money in high-risk technologies that could significantly change how BMDO develops future systems. The technologies pursued include: next generation sensors, power, information processing, optics, advanced materials, propulsion and communication. This project causes and exploits breakthroughs in science that will keep BMD at the foremost edge of what is possible. A primary project goal is to conduct proof-of-concept demonstrations that transition technology to development programs.

Many of today's baseline technologies on BMDO systems like Theater High Altitude Area Defense (THAAD), Patriot Advanced Capability (PAC3), and Ground Based Radar (GBR) are available due to the wise investment in innovative technologies some 10 years ago. Examples include: indium antimonide and mercury cadmium telluride ultra-sensitive infrared detectors; 32-bit radiation hardened Reduced Instruction Set Computer (RISC) processors for image analysis; composite materials for lightweight satellite structures; interferometric fiber-optic gyroscopes for sophisticated guidance and control; and solid-state gallium arsenide transmitter/receivers for BMDO radars. The IST program is the only R&D program in the Defense Department focused on future BMDO technical requirements.

The Small Business Innovative Research (SBIR) and the Small Business Technology Transfer (STTR) programs for all of BMDO are managed under this budget item. Pursuant to PL 102-564, a two-phased competition for small businesses with innovative technologies is conducted, focusing on BMDO relevant technologies with an emphasis on technologies with potential dual use.

Acquisition Strategy This R&D program receives proposals in response to an annual Broad Agency Announcement of research opportunities. Proposals received are competitively judged according to BMD relevance, cost, and capabilities of the offeror. Strong emphasis is placed on the dual-use nature of the proposed effort. For the SBIR and STTR programs, BMDO conducts the competitions and the executing agents award and manage the contracts.

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>					DATE <b>February 1997</b>
<b>BUDGET ACTIVITY</b> <b>2 - Applied Research</b>			<b>PE NUMBER AND TITLE</b> <b>0602173C Support Technologies - Applied Research</b>		
<b>B. <u>Program Change Summary (\$ in Thousands)</u></b>					
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>
Previous President's Budget	89,230	94,023	86,459	86,702	356,414
Appropriated Value		104,023			
Adjustments to Appropriated Value:					
a. MEADS below threshold reprogramming		-1,109			
b. General Reductions (FFRDC, Inflation etc.)		-404			
Current Budget Submit/President's Budget	96,092	102,510	101,932	95,488	396,022
Change Summary Explanation:					
Funding: FY97 Congressional Plus-up for wide band-gap semiconductor research initiative.					
Schedule:					
Technical:					
<b>C. <u>Other Program Funding Summary (\$ in Thousands)</u></b>					
See individual project R-2 exhibits					
<b>D. <u>Schedule Profile</u></b>					
See individual project R-2 exhibits					
<i>Page 2 of 11 Pages</i>					Exhibit R-2 (PE 0602173C)

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>								DATE <b>February 1997</b>			
BUDGET ACTIVITY <b>2 - Applied Research</b>				PE NUMBER AND TITLE <b>0602173C Support Technologies - Applied Research</b>				PROJECT <b>1651</b>			
COST (\$ In Thousands)		FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
1651 Innovative Science and Technology (IST)		47,852	56,009	50,923	50,094	43,774	41,411	42,505	43,506	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

To prepare to meet critical future active defense needs, advanced technology programs invest in an aggressive program of high leverage technologies that yield markedly improved capabilities across a selected range of boost phase and terminal defense interceptors, advanced target sensors, and innovative science. The objectives of these investments are to provide: (1) component technologies that offer improved performance or reduced costs for BMDO acquisition programs; (2) a better understanding of the physical processes to support these acquisition programs; and (3) technical solution options to mitigate unpredicted threats. Unlike other BMDO projects that fund near term technology and testing efforts, this advanced technology initiative invests seed money in high-risk technologies that could significantly change how BMD develops future systems. The technologies pursued include: next generation sensors, power, information processing, optics, advanced materials, propulsion and communication. This project causes and exploits breakthroughs in science that will keep BMD at the foremost edge of what is possible. A primary project goal is to conduct proof-of-concept demonstrations that transition technology to development programs.

Many of today's baseline technologies on BMDO systems like Theater High Altitude Area Defense (THAAD), Patriot Advanced Capability (PAC3), and Ground Based Radar (GBR) are available due to the wise investment in innovative technologies some 10 years ago. Examples include: indium antimonide and mercury cadmium telluride ultra-sensitive infrared detectors; 32-bit radiation hardened Reduced Instruction Set Computer (RISC) processors for image analysis; composite materials for lightweight satellite structures; interferometric fiber-optic gyroscopes for sophisticated guidance and control; and solid-state gallium arsenide transmitter/receivers for BMDO radars. The IST program is the only R&D program in the Defense Department focused on future BMDO technical requirements.

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY 2 - Applied Research	PE NUMBER AND TITLE 0602173C Support Technologies - Applied Research	PROJECT 1651
<u>FY 1996 (\$ in Thousands)</u>		
- \$16,898	Battle Management/Command, Control and Communications (BM/C3): Invested in advanced FPA; Light Detection and Ranging (LIDAR); sensor fusion prototype for target handover and multi-sensor fusion; and missile signatures. Began development of affordable wafer scale associative string processor (WASP) supercomputer capable of 50 GOPS per second. Continued to develop the superconducting terahertz modem for spread-spectrum, code division multiple access communications for BMDO battle management. Invested in laser diodes for communication; laser satellite communication systems; terahertz communication sources; and spread-spectrum CDMA communications modem. Flight tested the laser satellite communication system using an air-to-ground link to demonstrate free-space communications at data rates greater than 1 gigabyte per second. Began development of fast frame seeker (2 kHz) real-time 3-D read-out from a 64x64 focal plane array into a next generation, artificial neural network special purpose computer capable of 1022 interconnects per second in under 2 watts. Invested in neural networks for image recognition, optical image processing, multi-sensor tracking. Supported Navy LEAP FTV-3 and FTV-4 tests. For FTV-4, tracked target vehicle from horizon to horizon in real time images and provided the only enhanced image showing the target, interceptor and carrier vehicles, and established miss distance. Demonstrated real-time sensor data fusion of angle-angle radar data and participate in US-Australian real-time sensor data fusion communication experiment. Provided an Australian test range the imaging and range data and fused them with the Australian radar data for real-time transmission to US.	
- \$8,900	Materials: Continued the development of wide band-gap semiconductors for non-volatile memory and advanced ultraviolet sensors. Continued research of all-optical packet switched terabit per second computer networks for BM/C3 and simulation. Integrated the gallium arsenide quantum-well focal-plane array with a monolithic readout and the associated optics into a completed camera system.	
- \$7,400	Sensors: Continued the R&D projects on dual-band solar blind detectors and plume spectroscopy and radiometry measurements. Invested in advanced infrared and ultraviolet detectors, including multi-spectral and hyperspectral capabilities. Field demonstrated the associative string processor, linked to a large-format focal plane array. Invested in flying sensor and processing testbed for pre-launch and boost-phase targets (VIGILANTE); advanced 3-D neural coprocessor; software library for high-speed automatic target recognition. Completed Skipper integration and ground testing and deliver spacecraft to Russia for launch on a Molniya launch vehicle. Launched the SKIPPER satellite.	
- \$7,062	Propulsion: Continued the R&D program on advanced thermoplastic elastomers for solid rocket propellant. Ground demonstrated integrated RHETT propulsion system for spacecraft with performance of 1600 sec specific impulse and nearly 50% efficiency with an input power of 1.5 kW. The integrated RHETT propulsion system includes the thruster, power processing unit, propellant delivery system, and mechanical structure with a total mass of 23 kg.	
Project 1651	Page 4 of 11 Pages	Exhibit R-2 (PE 0602173C)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1997
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
<b>2 - Applied Research</b>	<b>0602173C Support Technologies - Applied Research</b>	<b>1651</b>
– \$7,592	Power: Continued IST advances in wide band-gap materials for high-power electronic devices to reduce the weight and volume of ground-based radar power supplies. Completed flight qualification testing of a SCARLET array designed for operation in high radiation environments. The array was designed, fabricated, qualified, and integrated in the spacecraft, and launched in a total of only 9 months. Initiated design of a 2.6 kW advanced SCARLET array to provide power to NASA's first New Millennium Deep Space spacecraft. Completed design of advanced SCARLET array for the New Millennium flight demonstration with specific power of >50 W/kg using 24% efficient multiple band-gap photovoltaic cells. Delivered the engineering prototype of the photovoltaic flight solar cell. Assessed the conceptual feasibility of a cryogenic ground based radar system using a high temperature superconducting (HTS) generator. Initiated fabrication of the HTS coils for the power system demonstrator.	
– \$47,852	Total	
<u>FY 1997 (\$ in Thousands)</u>		
– \$19,597	BM/C3: Test the fast framing seeker in a real interceptor scenario to test its ability to do passive discrimination. Invest in neural networks for image recognition, optical image processing, multi-sensor tracking. Invest in ultra-stable laser diodes for optical communication; laser satellite communication systems; terahertz communication sources; and spread-spectrum CDMA communications modem.	
– \$13,166	Materials: Advance the development of wide band gap semi-conductors, targeting gallium nitride and silicon carbide, and establishing a facility specifically for material growth and material characterization research. Begin development of advanced optical polymers to be used in 10 wavelength transmitters to achieve 1 terabit/sec transmission rate.	
– \$4,160	Sensors: Demonstrate Fast Frame Seeker capability against simulated infrared missile targets in a gimbaled test cell. Invest in flying sensor and processing prototype for pre-launch and boost-phase targets (VIGILANTE); advanced 3-dimensional neural coprocessor; software library for high-speed automatic target recognition.	
– \$5,072	Propulsion: Invest in high-impulse solid propellants; electric propulsion thrusters; and propellant manufacturability, for hypervelocity interceptors. Flight test the stationary plasma thrusters in space for satellite orbital transfer and orbit plane adjustment.	
– \$14,014	Power: Complete demonstration of a high temperature superconducting (HTS) generator. Complete development of an advanced power design for a Gallium Nitride Microwave amplifier, and conduct a Gallium Nitride field effect transistor (FET) performance test. Complete design of a cryo GBR power conditioning system. Initiate thermal system design for complete cryogenic radar system including TR modules, power conditioning system, power generation system, and staged cryogenic cooling system.	
– \$56,009	Total	
<u>FY 1998 (\$ in Thousands)</u>		
– \$21,836	BM/C3: Invest in neural networks for image recognition, optical image processing, multi-sensor tracking. Invest in ultra-stable laser diodes for optical communication; laser satellite communication systems; terahertz communication sources; and spread-spectrum CDMA communications modem, as progress warrants.	
Project 1651	Page 5 of 11 Pages	Exhibit R-2 (PE 0602173C)

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>		DATE <b>February 1997</b>
BUDGET ACTIVITY <b>2 - Applied Research</b>	PE NUMBER AND TITLE <b>0602173C Support Technologies - Applied Research</b>	PROJECT <b>1651</b>
- \$8,801	Materials: Invest in wide band-gap semiconductors; polymer-based electronics; digital superconducting electronics; non-volatile random access memory; and diamond windows and coatings. Demonstrate prototype GaN-based high microwave power amplifier operated at 300 degrees Centigrade.	
- \$5,116	Sensors: Complete HTS design of integrated cryogenic GBR system prototype. Complete fabrication of 500 kW prototype cryogenic power conditioning system for GBR. Complete thermal system design for prototype system. Demonstrate Fast Frame Seeker capability against simulated infrared missile targets in a gimbaled test cell. Perform integrated demonstration of sensor and processing prototype for pre-launch and boost-phase targets (VIGILANTE); demonstrate against ground and airborne TMD targets using both hyperspectral and multispectral capability.	
- \$5,187	Propulsion: Invest in high-impulse solid propellants; electric propulsion thrusters; and propellant manufacturability.	
- \$9,983	Power: Complete SCARLET ground qualification and acceptance testing. Complete integrated New Millennium spacecraft system ground qualification with SCARLET array wings in launch and initial operation of SCARLET in space. Initial report on flight system performance in space completed. Invest in advanced switching for radar; high-efficiency solar cells and concentrators; and miniature interceptor guidance technology. Demonstrate a GaN-based high microwave power amplifier, operated at 300 degrees C.	
- \$50,923	Total	
<u>FY 1999 (\$ in Thousands)</u>		
- \$21,503	BMC3: Invest in neural networks for image recognition, optical image processing, multi-sensor tracking and miniature interceptor guidance technology. Invest in ultra-stable laser diodes for optical communication; laser satellite communication systems; terahertz communication sources; and spread-spectrum CDMA communications modem, as progress warrants.	
- \$8,614	Materials: Continue to invest in wide band-gap semiconductors; polymer-based electronics; digital superconducting electronics; non-volatile random access memory; and diamond windows and coatings, as technical progress and system technology needs warrant.	
- \$5,040	Sensors: Continue to invest in sensor fusion and advanced neural network image recognition, as technical progress and system technology needs warrant.	
- \$5,602	Propellants: Continue to invest in high-impulse solid propellants; electric propulsion thrusters; and propellant manufacturability, as technical progress and system technology needs warrant.	
- \$9,335	Power: Continue to invest in a power conditioning system for radar, high-efficiency solar cells and concentrators as technical progress and system technology needs warrant.	
- \$50,094	Total	
<u>Acquisition Strategy</u> This R&D program receives proposals in response to an annual Broad Agency Announcement of research opportunities. Proposals received are competitively judged according to BMD relevance, cost, and capabilities of the offeror. Strong emphasis is placed on the dual-use nature of the proposed effort.		
Project 1651	Page 6 of 11 Pages	Exhibit R-2 (PE 0602173C)

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>					DATE <b>February 1997</b>							
BUDGET ACTIVITY <b>2 - Applied Research</b>			PE NUMBER AND TITLE <b>0602173C Support Technologies - Applied Research</b>			PROJECT <b>1651</b>						
<b>B. Program Change Summary (\$ in Thousands)</b>												
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total</u>							
					<u>Cost</u>							
Previous President's Budget	47,800	47,449	52,393	51,563	199,205							
Appropriated Value		57,449										
Adjustments to Appropriated Value:												
a. MEADS below threshold reprogramming		-1,109										
b. General Reductions (FFRDC, Inflation etc.)		-331										
Current Budget Submit/President's Budget	47,852	56,009	50,923	50,094	204,878							
Change Summary Explanation:												
Funding: FY97 Congressional Plus-up for wide band-gap semiconductor research initiative												
Schedule: None												
Technical: None												
<b>C. Other Program Funding Summary (\$ in Thousands)</b>												
	<u>FY 1996</u>	<u>FY 1997</u>	<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>To</u>	<u>Total</u>		
									<u>Compl</u>	<u>Cost</u>		
1651 Innovative Sci & Tech, PE 603173C		2,233							2,233	2,233		
The IST program acts as a creator of new technology for BMD. It feeds into all of the other BMDO technology programs and it acts as a catalyst to transition devices and components whose efficacy has been demonstrated under IST sponsorship into other advanced development programs.												
<b>D. Schedule Profile</b>												
		<u>FY 1996</u>			<u>FY 1997</u>			<u>FY 1998</u>		<u>FY 1999</u>		
	1	2	3	4	1	2	3	4	1	2	3	4
SKIPPER launch		X										
Deliver Lasercom System for STRV-2				X								
RHETT II hardware delivery				X								
SWARM reticle seeker tracking demo				X								
Wafer-Scale Associative String Processor Demo				X								
Project 1651												
Page 7 of 11 Pages												
Exhibit R-2 (PE 0602173C)												

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)													DATE February 1997				
BUDGET ACTIVITY <b>2 - Applied Research</b>						PE NUMBER AND TITLE <b>0602173C Support Technologies - Applied Research</b>								PROJECT <b>1651</b>			
<u>FY 1996</u>						<u>FY 1997</u>				<u>FY 1998</u>				<u>FY 1999</u>			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
				X													
4 Kbit Nonvolatile Random Access Memory in Silicon Carbide Demo				X													
ISTEF THAAD tests support				X						X							
Integrate 3D chip stack version VIGILANTE electronics					X												
ISTEF Red Tigress III data collection					X												
600GHz and 1 THz backward wave oscillator tested						X											
Mass Optical Storage demo						X											
Adv Signal Processor Prototype delivered						X											
Start preliminary VIGILANTE flights						X											
Integrate first VIGILANTE chip set in lab						X											
HTS generator demonstration						X											
Gallium Nitride FET performance test						X											
Deliver sensor package for EFEX 1,2							X							X			
SCARLET Array wings integrated with New Millennium spacecraft								X									
Demonstrate cryo transmit and receive tubes for GBR									X								
RHETT II flight test										X							
Cryo GBR power conditioning sys dem											X						
SCARLET solar array flight test											X						
Non-Linear Optics device demo											X						
NF2 propellant demo												X					
Voxel Cruncher delivered														X			
Cryo GBR 1 MW generator demo															X		
Load THAAD motor case with energetic elastomers propellant and characterize under operational conditions.															X		
Laser materials device decision															X		

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

DATE **February 1997**

BUDGET ACTIVITY  
**2 - Applied Research**

PE NUMBER AND TITLE  
**0602173C Support Technologies - Applied Research**

PROJECT  
**1651**

	<u>FY 1996</u>				<u>FY 1997</u>				<u>FY 1998</u>				<u>FY 1999</u>			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Advanced HWIL testbed demo at NRL																X

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>								DATE <b>February 1997</b>		
BUDGET ACTIVITY <b>2 - Applied Research</b>				PE NUMBER AND TITLE <b>0602173C Support Technologies - Applied Research</b>				PROJECT <b>1660</b>		
COST (\$ In Thousands)	FY 1996 Actual	FY 1997 Estimate	FY 1998 Estimate	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Cost to Complete	Total Cost
1660 Statutory and Mandated Programs	48,240	46,501	51,009	45,394	42,251	40,750	36,038	34,905	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

To prepare for critical future active defense needs, advanced technology programs will invest in a balanced program of high leverage technologies that yield improved capabilities across a selected range of boost phase and terminal missile defense interceptors, advanced target sensors, and innovative science. The objectives of these investments are component technologies with improved performance or reduced costs for acquisition programs, and technical solution options to mitigate advanced and unpredicted threats. Under this project, the SBIR and STTR programs explore innovative concepts pursuant to PL 102-564 which mandates a two phase competition for small businesses that are developing innovative technologies. Emphasis is placed on dual use technologies for future BMDO needs. Dual use means that the technologies will also be judged on their potential for future private sector investment, both as a vehicle for reducing development time and unit cost of new BMDO technologies as a route to national economic growth through new commercial products.

FY 1996 (\$ in Thousands)

- \$11,240      125 Phase I SBIR and STTR awards to 90 firms.
- \$37,000      70 Phase II SBIR and STTR awards to 38 firms.
- \$48,240      Total

FY 1997 (\$ in Thousands)

- \$11,367      200 Phase I SBIR and STTR awards to 140 firms.
- \$35,134      60 Phase II SBIR and STTR awards to 50 firms.
- \$46,501      Total

FY 1998 (\$ in Thousands)

- \$10,558      200 Phase I SBIR and STTR awards to 150 firms.
- \$40,451      55 Phase II SBIR and STTR awards to 70 firms.
- \$51,009      Total

FY 1999 (\$ in Thousands)

- \$9,119      160 Phase I SBIR and STTR awards to 130 firms.

**UNCLASSIFIED**

<b>RDT&amp;E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)</b>										DATE <b>February 1997</b>																																																																																												
<b>BUDGET ACTIVITY</b> <b>2 - Applied Research</b>					<b>PE NUMBER AND TITLE</b> <b>0602173C Support Technologies - Applied Research</b>					<b>PROJECT</b> <b>1660</b>																																																																																												
<p>– \$36,275      58 Phase II SBIR and STTR awards to 62 firms.</p> <p>– \$45,394      Total</p> <p><u>Acquisition Strategy</u> These competitively awarded programs are in response to annual announcement of research opportunities. Proposals received are judged according to technical and commercial potential.</p> <p><b>B. Program Change Summary (\$ in Thousands)</b></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY 1996</u></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget</td> <td style="text-align: right;">41,430</td> <td style="text-align: right;">46,574</td> <td style="text-align: right;">34,066</td> <td style="text-align: right;">35,139</td> <td style="text-align: right;">157,209</td> </tr> <tr> <td>Appropriated Value</td> <td></td> <td style="text-align: right;">46,574</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Adjustments to Appropriated Value:</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>    a. General Reductions (FFRDC, Inflation etc.)</td> <td></td> <td style="text-align: right;">-73</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Current Budget Submit/President's Budget</td> <td style="text-align: right;">48,240</td> <td style="text-align: right;">46,501</td> <td style="text-align: right;">51,009</td> <td style="text-align: right;">45,394</td> <td style="text-align: right;">191,144</td> </tr> </tbody> </table> <p>Change Summary Explanation:            Funding: Funding changes in Advanced Technology Development (0603173C) and in Applied Research (0602173C) are based on guidance stated in PL102-564.            Schedule: None            Technical: None</p> <p><b>C. Other Program Funding Summary (\$ in Thousands)</b></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>FY 1996</u></th> <th style="text-align: center;"><u>FY 1997</u></th> <th style="text-align: center;"><u>FY 1998</u></th> <th style="text-align: center;"><u>FY 1999</u></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> <th style="text-align: center;"><u>To Compl</u></th> <th style="text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td><b>D. Schedule Profile</b></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;"><u>FY 1996</u></td> <td></td> <td style="text-align: center;"><u>FY 1997</u></td> <td></td> <td style="text-align: center;"><u>FY 1998</u></td> <td></td> <td style="text-align: center;"><u>FY 1999</u></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">1</td> <td style="text-align: center;">2    3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2    3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2    3</td> <td style="text-align: center;">4</td> <td></td> </tr> <tr> <td>SBIR/STTR</td> <td style="text-align: center;">X</td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> </tbody> </table>													<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>	Previous President's Budget	41,430	46,574	34,066	35,139	157,209	Appropriated Value		46,574				Adjustments to Appropriated Value:						a. General Reductions (FFRDC, Inflation etc.)		-73				Current Budget Submit/President's Budget	48,240	46,501	51,009	45,394	191,144		<u>FY 1996</u>	<u>FY 1997</u>	<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>To Compl</u>	<u>Total Cost</u>	<b>D. Schedule Profile</b>													<u>FY 1996</u>		<u>FY 1997</u>		<u>FY 1998</u>		<u>FY 1999</u>				1	2    3	4	1	2    3	4	1	2    3	4		SBIR/STTR	X			X			X		X	
	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Total Cost</u>																																																																																																	
Previous President's Budget	41,430	46,574	34,066	35,139	157,209																																																																																																	
Appropriated Value		46,574																																																																																																				
Adjustments to Appropriated Value:																																																																																																						
a. General Reductions (FFRDC, Inflation etc.)		-73																																																																																																				
Current Budget Submit/President's Budget	48,240	46,501	51,009	45,394	191,144																																																																																																	
	<u>FY 1996</u>	<u>FY 1997</u>	<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>To Compl</u>	<u>Total Cost</u>																																																																																												
<b>D. Schedule Profile</b>																																																																																																						
		<u>FY 1996</u>		<u>FY 1997</u>		<u>FY 1998</u>		<u>FY 1999</u>																																																																																														
	1	2    3	4	1	2    3	4	1	2    3	4																																																																																													
SBIR/STTR	X			X			X		X																																																																																													
Project 1660			Page 11 of 11 Pages				Exhibit R-2 (PE 0602173C)																																																																																															