

# ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2005

## BUDGET ACTIVITY

**4 - Advanced Component Development and Prototypes**

## PE NUMBER AND TITLE

**0603 4A - Night Vision Systems Advanced Development**

## PROJECT

**131**

COST (In Thousands)	FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
131 NIGHT VISION SYS A/DEV	6651	17052	6885	5410	3583	2723	5836	5954	Continuing	65078

**A. Mission Description and Budget Item Justification:** This program addresses initiatives to develop and transition technologies from the laboratories and industry in order to improve fielded equipment in the current force as well as initiation, development, and engineering/program management support of systems for fielding to the Future Force Units of Action/Employment (FF UA/UE) and Future Combat System (FCS). Efforts include the development of an uncooled infrared imaging "B-Kit" to integrate this technology across many FF systems for lower costs for production, fielding and maintenance. 3rd Gen high performance thermal imaging technology will allow simultaneous operation in the mid and long wavelength infrared bands for significantly improved ranges for acquisition of enemy forces. Sense Through The Wall (STTW) technology will improve survivability and lethality of UA/UE troops in urban environments by allowing them to detect motion through buildings and other man-made objects. This effort will be pursued in two realms, Unattended Ground Vehicle mounted for close-in and a manned ground vehicle mounted stand-off mode for infantry and intelligence missions. Imaging for REMBASS / Unattended Ground Sensors (UGS) will demonstrate the benefits of an integrated remote imaging capability with current (REMBASS) and future force (UGS) detection and tracking sensors. A major thrust will be to transition technologies to acquisition programs that meet required, advanced sensor capabilities of the FF and FCS requirements documents. This will include the ability for sensors to accomplish foliage penetration (FOPEN), Aided Target Recognition (ATR), and Close Surveillance Support System for 360 degree situational awareness for vehicles. FOPEN will allow UA/UE troops to discern enemy positions under the cover of trees and other natural cover. ATR will provide the FF unprecedented capability in automatic target hand-off. Close Surveillance Support System will allow any future vehicle crew member to see outside the vehicle in day or night without the blind spots created by armor. This will allow much improved maneuvering in urban/complex terrain, tracking of friendly soldiers and vehicles, and detection and engagement of dismounted and vehicular threats to the lighter FCS combat vehicles. Other emerging concepts resulting from ongoing operations will be supported by this program, to include route reconnaissance for road hazards, battle damage assessment including decoy and camouflage detection, detection of threat soldiers carrying RPGs, and identification of Improvised Explosive Devices (IED) and suicide bombers. FY 2005 supports a Congressional addition, developing and demonstrating the sensor portion of the Family of Integrated Rapid Response Equipment (FIRRE). FIRRE demonstrates perimeter security capabilities for fixed site applications.

FY2006/2007 funding supports continuing 3rd Gen FLIR, STTW, UGS, FOPEN, ATR, and Close Surveillance Support System as well as emerging concepts of route reconnaissance, battle damage assessment, detection of personnel with RPGs, IEDs, and suicide bombers.

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<u>Accomplishments/Planned Program</u>			FY 2004	FY 2005	FY 2006	FY 2007
Uncooled B-Kit – Extend uncooled focal plane array technology capability across multiple platforms to allow interchangeable parts for lower cost, weight, power, and volume. FY03 effort began establishment of technical specifications, producibility and timelines across FCS and Future Force systems for a Risk Reduction Demonstration decision in FY04. FY06 and beyond supports the expansion of the Uncooled B Kit (UBK) family to include larger and smaller arrays.			1635	0	896	1169
Advanced EOIR Payload with Laser Designator - conduct market survey and perform flight evaluation of potential solution for advanced UAV Payloads incorporating Laser Designation capability			789	0	0	0
Sense Through The Wall Technology to sense motion in buildings or behind other small structures from a stand-off distance. This is a concept development effort to address key FCS systems requirements. Follow on efforts explore application to existing platforms.			1851	542	1083	1066
Emerging Concepts – Explore a range of potential technologies for FCS and the Future Force that will enable route reconnaissance, battle damage assessment, and detection of threats such as personnel with RPGs, IEDs, and suicide bombers.			405	172	506	450
Foliage Penetration (FOPEN) - Technology to sense the presence of personnel and man-made objects under natural foliage. This concept development effort defines technology options, develops alternatives, and refines Army requirements. FOPEN transitions technology from the DARPA Forrester program, which demonstrates in 4QFY05-FY06			130	0	1122	1186
Aided Target Recognition (ATR) - Technology to allow FCS and the Future Force sensors to automatically detect and recognize targets, and cross cue other sensors in a tactical environment. This concept development effort defines technology, develops alternatives, and refines Army requirements. Near term products include super resolution image processing software.			185	81	362	182
Close Surveillance Support System - Perform concept development and demonstrations for a vehicle sensor system that provides an unimpeded 360 degree view of the immediate area around the vehicle from any crew position for situational awareness and threat detection. FY04 established general employment concepts and user/system needs. FY05/06 procures a demonstrator/test bed and further refines Operational concepts of employment. This effort compliments the Distributed Aperature System (DAS) ATD.			1300	768	961	0
3rd Gen FLIR - Initiate Concept and Technology Development for 3rd Gen FLIR, the next generation of advanced primary reconnaissance imaging systems for the Future Force to include FCS Unit of Action. FY04/05 supports the integration and demonstration of 3rd Gen FLIR prototypes from the 3rd Gen FLIR STO into an LRAS3, enabling side-by-side user evaluation of 3rd Gen vs 2nd Gen FLIR. FY06/07 efforts will 'productize' the 3rd Gen Detector/DEWAR/Cooler assembly for use in ground and aerial, manned and unmanned applications (as a common component).			0	896	983	835

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### Accomplishments/Planned Program B(continued)

	FY 2004	FY 2005	FY 2006	FY 2007
Establishment of Joint Unique Identification Program, with Army as executive agency, will be moved to new PE once established.	0	10048	0	0
Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR)	0	490	0	0
Transition OVERWATCH ATD technology into current and future systems applications.	0	0	344	522
FIRRE FY05 efforts define the sensor requirements and procure the sensors to support demonstration of an integrated capability which could be quickly fielded. This effort compliments FIRRE efforts funded by PM Force Protection.	0	3588	0	0
Demonstration and testing of CRS3 (supports demonstration and testing of CRS3 developed in PE 64710 Project DL76 in FY04).	0	298	0	0
Imaging for REMBASS/UGS. Demonstrates capabilities from integrating a remote imaging capability with the detection and tracking capabilities of REMBASS (current) and Future Force UGS.	0	169	628	0
Theater Support Vessel (TSV) - Perform concept studies and systems engineering for sensor systems required to recon, and maneuver in unimproved ports and maintain situational awareness of line of sight land threats by TSVs transporting future ground forces	356	0	0	0
<b>Totals</b>	<b>6651</b>	<b>17052</b>	<b>6885</b>	<b>5410</b>

### B. Program Change Summary

	FY 2005	FY 2006	FY 2007
Previous President's Budget (FY 2005)	14047	8407	6792
Current Budget (FY 2006/2007 PB)	17052	6885	5410
Total Adjustments	3005	-1522	-1382
Net of Program/Database Changes			
Congressional Program Reductions	-255		
Congressional Rescissions			
Congressional Increases	3750		
Reprogrammings			
SBIR/STTR Transfer	-490		
Adjustments to Budget Years		-1522	-1382

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FY 2005 Congressional Increase of \$3.75M for Night Vision Systems Advanced Development (FIRRE).  
FY 2006/FY2007 \$1.522M and \$1.382M realigned to PE/Project 643773.U02, Unique Identification (UID) program

<b>C. Other Program Funding Summary</b>	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	ToCompl	TotalCost
PE 0602709A/Night Vision and Electro-Optical Technology	21634	26406	23823	26686	28309	29395	30227	30441	Continue	Continue
PE 0603710A/Night Vision Advanced Development	82800	102047	51761	49341	42638	43097	49173	49622	Continue	Continue
PE 0604710A/Night Vision Devices Engineering Development	37452	26119	26449	38224	51748	28577	23231	22619	Continue	Continue
K38300 LRAS3	50470	48192	42293	1777	0	0	0	0	0	142732
G86100 Future Combat System	0	0	0	0	167402	328778	1520447	3621968	Continue	Continue
BA0330 TUAV	121616	131471	26000	36169	42774	101356	129056	27611	Continue	Continue
W61900 IAV	110042	117670	146085	137375	42817	0	44635	27856	0	626480
PE 654645 FCS (UGS)	0	130935	86445	106341	116608	118798	117904	81003	Continue	Continue

**D. Acquisition Strategy:** The advances and improvements for cooled and uncooled thermal imaging sensors, radars, Sense Through The Wall systems, and Unattended Ground Sensors activities utilize various cost reimbursement development contracts that were, and will continue to be competitively awarded using best value source selection procedures.

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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Laser Protection	C/CP, MIPR	DRS, Dallas, TX /SBRC, Santa Barbara, CA; NVESD	2326	0		0		0		0	2326	2326
b . Foliage Penetration efforts	T&M, MIPR	TBS	130	0		712	2Q	1076	1-4Q	Continue	Continue	Continue
c . CIRISS efforts	T&M	Various	441	0		0		0		0	441	441
d . Sensor Link Protocol efforts	MIPR	Various	105	0		0		0		0	105	105
e . Demo of payload & systems integration TSP	SS/CPFF	TRW, Sierra Vista, AZ	400	0		0		0		0	400	400
f . 3rd Gen FLIR	MIPR	NVESD	0	696	2Q	878	1Q	723	1Q	Continue	Continue	Continue
g . Close Surveillance Support System efforts	T&M	TBS	1101	668	2Q	776	1Q	0		Continue	Continue	Continue
h . Emerging Concepts efforts	T&M	Various	799	146	1Q	386	2Q	360	2Q	Continue	Continue	Continue
i . TUAV Laser Rangefinder	C/CP	Versitron, Santa Rosa, CA	300	0		0		0		0	300	300
j . Land Warrior			3750	0		0		0		0	3750	3750

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I. Product Development (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
k . Award CAD Contract for TSP	C/CPFF	Applied Science Technologies, Sunnyvale, CA; BAE Nashua, NH	10967	0		0		0		0	10967	10967
l . Theater Support Vessel study	TBD	TBS	106	0		0		0		0	106	106
m . ATR/ATC Activities	MIPR	Various	462	0		0		0		0	462	462
n . Uncooled B-Kit Evolution/Development	C/CP, MIPR	ADC, Newington, VA; Various others	3989	0		806	2Q	839	1Q	Continue	Continue	Continue
o . FLIR Develop/Integrate	Various	Various	1938	0		0		0		0	1938	1938
p . UAV Quieting, Etc. TSP	MIPR	TUAV Proj Office, Redstone Arsenal, AL	900	0		0		0		0	900	900
q . LRAS3 /LLDR Telescopic Mast Demo	MIPR	NVESD	685	0		0		0		0	685	685
r . Demo and eval of ENVG technology (Tx to DL67)	Various	Various	1778	0		0		0		0	1778	1778
s . Multifunction Laser Design (Tx to DL67)	C/CP	Raytheon, Dallas, TX	906	0		0		0		0	906	906

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I. Product Development (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
t . SR2P	MIPR	NVESD	658	0		0		0		0	658	658
u . Demo and eval of ANVG (Tx to DL67)	Various	Various	1320	0		0		0		0	1320	1320
v . Head Tracked Commander's Sight	C/CP	Various	223	0		0		0		0	223	223
w . Large Format Array Uncooled Thermal Sight	C/CP	(Soldier effort)	400	0		0		0		0	400	400
x . Unattended Ground Sensors	Various	Various	2970	0		0		0		0	2970	2970
y . SBIR/STTR			0	490		0		0		0	490	490
z . Sense Through the wall Unmanned/Stand-Off	MIPR	Ft Huachuca & I2WD	2357	377	2Q	623	1Q	811	2Q	Continue	Continue	Continue
aa. Multi-mode Radar	Various	Various	789	0		0		0		0	0	0
bb. Aided Target Recognition efforts	T&M	TBS	160	81	1Q	282	1Q	122	1Q	0	645	645
cc. Cost Benefit Analysis TUAV	MIPR and C/FP	TRAC-WSMR, NM and TBE, Huntsville, AL	910	0		0		0		0	910	910

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I. Product Development (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
dd. CRS3 Testing	MIPR	RTTC, Huntsville, AL	0	238	2Q	0		0		0	238	238
dd. Overwatch efforts	MIPR and C/FP	Various	0	0		284	2Q	447	1-4Q	0	731	866
ee. FIRRE Efforts	TBD	TBS	0	3178	2-3Q	0		0		0	3178	3137
ee. UID Program			0	10048		0		0		0	10048	10048
ff. Imaging for REMBASS/UGS	C/FP	TBS	0	149	3Q	511	1Q	0		0	660	807
Subtotal:			40870	16071		5258		4378		Continue	Continue	Continue



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II. Support Cost	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Matrix Support	MIPR	Various	1425	265	1Q	240	1Q	160	1Q	Continue	Continue	Continue
b . Engineering Support	FFP	CSC, Falls Church, VA	0	521	2Q	392	2Q	275	2Q	Continue	Continue	Continue
c . Matrix Support	MIPR	CECOM Fort Monmouth, NJ	2000	0		0		0		0	2000	2000
d . Engineering Support	FFP	MITRE; McLean, VA	1216	0		0		0		0	1216	1216
e . Engineering Support	FFP	CACI, Fort Monmouth, NJ	2356	0		0		0		0	2356	2356
Subtotal:			6997	786		632		435		Continue	Continue	Continue
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Multispectral Eval	MIPR	WSMR	308	0		0		0		0	308	308
b . FLIR Demos and Evals	MIPR	Various	836	0		0		0		0	836	836
c . ENVG Demos and Evals	MIPR	Various	105	0		0		0		0	105	105
d . HT Command Site Eval	MIPR	Various	90	0		0		0		0	90	90

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III. Test and Evaluation (continued)	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
e . ANVG Test Plan and Flight Support	MIPR	Various	480	0		0		0		0	480	480
f . ANVG Simulation/Field Eval	MIPR	Various	100	0		0		0		0	100	100
g . STTW/UGS	MIPR	Various	757	0		280	2-3Q	100	4Q	0	1137	1137
h . Operational Assessment of TSP Flight Demos	MIPR	AEC, APG, MD	350	0		0		0		0	350	350
i . Payload Demo and Emitter Spt Assessment	MIPR	EPG, Ft Huachuca, AZ	1165	0		0		0		0	1165	1165
j . Uncooled B Kit Eval	MIPR	TBD	0	0		0		185	3Q	0	185	185
k . FOPEN Eval	MIPR	TBD	0	0		320	3-4Q	0		0	320	320
l . ATR/CS3/Overwatch Evals	MIPR	TBD	0	0		105	2-3Q	60	3Q	0	165	165
m . REMBASS/UGS Demo	MIPR	TBD	0	0		65	2-3Q	0		0	65	0
n . Emerging Concepts Demo	MIPR	TBD	0	0		0		30	3Q	0	30	0
Subtotal:			4191	0		770		375		0	5336	5241

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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a . Program Management		PM-NV/RSTA, Ft.Belvoir, VA	655	195	1-4Q	225	1-4Q	222	1-4Q	Continue	Continue	Continue
Subtotal:			655	195		225		222		Continue	Continue	Continue
Project Total Cost:			52713	17052		6885		5410		Continue	Continue	Continue

# Schedule Profile (R4 Exhibit)

February 2005

BUDGET ACTIVITY

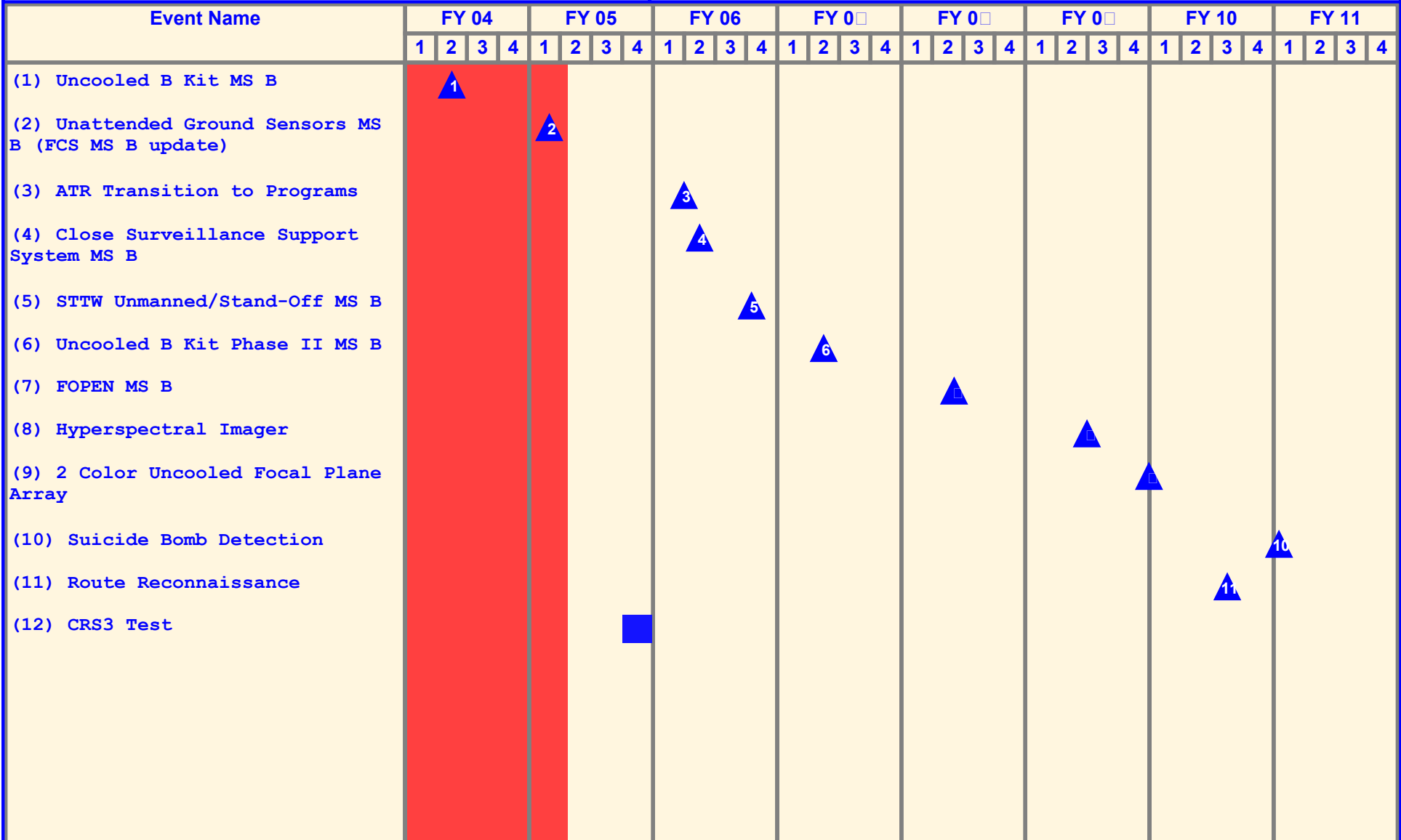
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## Schedule Detail (R4a Exhibit)

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<u>Schedule Detail</u>	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Uncooled B Kit MS B	2Q							
Uncooled B Kit Spiral Development	2-4Q		1-4Q	1-2Q				
Foliage Penetration Development			1-4Q	1-4Q	1-2Q			
Foliage Penetration Milestone B for Block II FCS					2Q			
3rd Gen FLIR Development		1-4Q	1-4Q	1-4Q	1-4Q			
Sense Thru The Wall (STTW) Development			1-4Q	1-4Q				
Sense Thru The Wall (STTW) MS B				4Q				
Unattended Ground Sensors (UGS) MS B for FCS UA		1Q						
Aided Target Recognition (ATR)		4Q	1-4Q	1-4Q				
Develop spectral/thermal						2-4Q	1-4Q	1-4Q
2 Color Uncooled Focal Plane Array						4Q	1-4Q	1-4Q
Route Reconnaissance							3-4Q	1-4Q