

UNCLASSIFIED

PE NUMBER: 0305165F
 PE TITLE: NAVSTAR GPS (Space)

| | | | | | | | | | |
|--|-------------------|---------------------|---------------------|---|---------------------|---------------------|---------------------|-------------------------------------|-------|
| Exhibit R-2, RDT&E Budget Item Justification | | | | | | | | DATE February 2004 | |
| BUDGET ACTIVITY 07 Operational System Development | | | | PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space) | | | | | |
| Cost (\$ in Millions) | FY 2003 Actual | FY 2004 Estimate | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | FY 2008 Estimate | FY 2009 Estimate | Cost to Complete | Total |
| Total Program Element (PE) Cost | 284.036 | 144.790 | 148.344 | 117.813 | 94.558 | 43.657 | 39.758 | Continuing | TBD |
| 3030 NAVSTAR GPS (Space & Control) | 284.036 | 144.790 | 148.344 | 117.813 | 94.558 | 43.657 | 39.758 | Continuing | TBD |

(U) A. Mission Description and Budget Item Justification

This program element funds Research and Development for the Navstar Global Positioning System (GPS) Space and Control segments of the overall GPS program. This includes, but is not limited to: satellite development, training simulators, development of an Integrated Mission Operation Support Center (IMOSC), Integrated Logistics Support (ILS) products, and ground control segment development, procurement, and operation; sustaining engineering; space and ground segments upgrades; and R&D efforts to support the entire GPS system deployment. This Program Element (PE) funds the Research and Development (R&D) for modernization and future GPS systems including efforts to provide anti-jam capability through increased M-Code signal power, as soon as practical.

GPS Block IIF satellites and IIR satellites will be modified to include a second civil signal and new military signal. Block IIF satellites will also include a third civil signal (L5). A new GPS Block III program (PE 0603421F) was initiated after new start approval in August 2000 to incorporate a higher power military signal to provide enhanced anti-jam capability, the second and third civil signals, and the new military signal.

GPS Modernization Stewardship funds efforts which are of a national scale, joint civil-military in nature, and benefit two or more agencies. Stewardship funding requirement transferred from PE 0603421F to this PE starting in FY04.

This program is in Budget Activity 7 - Operational Systems Development because it is a post-Milestone III program.

(U) B. Program Change Summary (\$ in Millions)

| | <u>FY 2003</u> | <u>FY 2004</u> | <u>FY 2005</u> |
|---|----------------|----------------|----------------|
| (U) Previous President's Budget | 285.415 | 146.468 | 129.933 |
| (U) Current PBR/President's Budget | 284.036 | 144.790 | 148.344 |
| (U) Total Adjustments | -1.379 | -1.678 | |
| (U) Congressional Program Reductions | 0.000 | -1.678 | |
| Congressional Rescissions | | | |
| Congressional Increases | | | |
| Reprogrammings | -1.379 | | |
| SBIR/STTR Transfer | | | |
| (U) <u>Significant Program Changes:</u> | | | |

Exhibit R-2a, RDT&E Project Justification

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| BUDGET ACTIVITY 07 Operational System Development | | PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space) | | | | | PROJECT NUMBER AND TITLE 3030 NAVSTAR GPS (Space & Control) | | | |
|--|-------------------|---|---------------------|---------------------|---------------------|---------------------|--|---------------------|-------|--|
| Cost (\$ in Millions) | FY 2003 Actual | FY 2004 Estimate | FY 2005 Estimate | FY 2006 Estimate | FY 2007 Estimate | FY 2008 Estimate | FY 2009 Estimate | Cost to Complete | Total | |
| 3030 NAVSTAR GPS (Space & Control) | 284.036 | 144.790 | 148.344 | 117.813 | 94.558 | 43.657 | 39.758 | Continuing | TBD | |
| Quantity of RDT&E Articles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |

(U) A. Mission Description and Budget Item Justification

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GPS Modernization Stewardship funds efforts which are of a national scale, joint civil-military in nature, and benefit two or more agencies. Stewardship funding requirement transferred from PE 0603421F to this PE starting in FY04.

This program is in Budget Activity 7 - Operational Systems Development because it is a post-Milestone III program.

(U) B. Accomplishments/Planned Program (\$ in Millions)

| | <u>FY 2003</u> | <u>FY 2004</u> | <u>FY 2005</u> |
|--|----------------|----------------|----------------|
| (U) Continue system engineering, spectrum/frequency management and program operations | 10.041 | 16.763 | 6.776 |
| (U) Continue IIF satellite development | 4.487 | 1.100 | 0.100 |
| (U) Continue GPS Modernization for Space (for IIR and IIF satellites) and enhanced anti-jam capabilities | 89.589 | 10.817 | 5.353 |
| (U) Continue IIF Spacecraft Parts Obsolescence | 0.000 | 1.000 | 37.000 |
| (U) Continue OCS development/modernization | 179.919 | 110.510 | 94.415 |
| (U) GPS Stewardship (FY03 funded in PE 0603421F) | 0.000 | 4.600 | 4.700 |
| (U) Total Cost | 284.036 | 144.790 | 148.344 |

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Exhibit R-2a, RDT&E Project Justification

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| | | |
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| BUDGET ACTIVITY 07 Operational System Development | PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space) | PROJECT NUMBER AND TITLE 3030 NAVSTAR GPS (Space & Control) |
|---|--|---|

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

| | <u>FY 2003</u> | <u>FY 2004</u> | <u>FY 2005</u> | <u>FY 2006</u> | <u>FY 2007</u> | <u>FY 2008</u> | <u>FY 2009</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) AF RDT&E Related RDT&E (PE 0603421F, (U) BA-4/R-40, Project 644993 - GPS Block III) | 46.633 | 0.000 | 40.568 | 180.023 | 291.035 | 779.493 | 794.030 | Continuing | TBD |
| (U) Other APPN Operations and Maintenance (U) (PE 0305165F, BA 1 - Operating Forces, SAG 13D) Missile Procurement (PE (U) 0305165F, BA 5 - Space and Other Support, P-31, 32) Other Procurement (PE 0305165F, BP 83 - Electronics and Telecommunications (U) Equipment, WSC 6790, P-70, and WSC 6730; BP 86 - Spares & Repair Parts, WSC 190A, P-111) | 41.663 | 53.205 | 65.991 | 67.497 | 78.468 | 81.947 | 82.354 | Continuing | TBD |
| (U) 0305165F, BA 5 - Space and Other Support, P-31, 32) Other Procurement (PE 0305165F, BP 83 - Electronics and Telecommunications (U) Equipment, WSC 6790, P-70, and WSC 6730; BP 86 - Spares & Repair Parts, WSC 190A, P-111) | 249.794 | 255.758 | 330.530 | 341.482 | 265.975 | 132.051 | 82.367 | Continuing | TBD |
| (U) Equipment, WSC 6790, P-70, and WSC 6730; BP 86 - Spares & Repair Parts, WSC 190A, P-111) | 19.926 | 12.495 | 7.804 | 13.547 | 12.051 | 10.359 | 22.889 | Continuing | TBD |

(U) D. Acquisition Strategy

GPS OCS upgrade was competitively awarded to a single contractor (Lockheed Martin) in July 1995. Block IIF satellite and IIF ground systems development contract was competitively awarded to a single contractor (Boeing) in April 1996. The Single Prime Initiative (SPI) consolidated these efforts and was added to the Boeing IIF contract (with Lockheed Martin as a subcontractor) on 1 Oct 99. GPS Modernization efforts for the Block IIR were awarded sole source to Lockheed Martin under a new contract in August 2000. Modernization efforts for Block IIF were added to the existing contract with Boeing as Engineering Change Proposals (ECPs).

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| Exhibit R-3, RDT&E Project Cost Analysis | | | | | | | | | | DATE February 2004 | | |
|--|-----------------------------------|---|--|--|---|---|---|---|---|-----------------------------------|-----------------------------|---|
| BUDGET ACTIVITY 07 Operational System Development | | | | PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space) | | | | PROJECT NUMBER AND TITLE 3030 NAVSTAR GPS (Space & Control) | | | | |
| <u>(U) Cost Categories</u> (Tailor to WBS, or System/Item Requirements) (\$ in Millions) | <u>Contract Method & Type</u> | <u>Performing Activity & Location</u> | <u>Total</u> <u>Prior to FY</u> <u>2003</u> <u>Cost</u> | <u>FY</u> <u>2003</u> <u>Cost</u> | <u>FY</u> <u>2003</u> <u>Award</u> <u>Date</u> | <u>FY</u> <u>2004</u> <u>Cost</u> | <u>FY</u> <u>2004</u> <u>Award</u> <u>Date</u> | <u>FY</u> <u>2005</u> <u>Cost</u> | <u>FY</u> <u>2005</u> <u>Award</u> <u>Date</u> | <u>Cost to</u> <u>Complete</u> | <u>Total</u> <u>Cost</u> | <u>Target</u> <u>Value of</u> <u>Contract</u> |
| <u>(U) Product Development</u> | | | | | | | | | | | | |
| Applied Research Labs | MIPR | Various | 3.649 | 0.000 | | 0.000 | | 0.000 | | Continuing | TBD | 0.000 |
| OCS Development & IIF Modernization & IIF Spacecraft Parts Obsolescence (F0470196C0025) | FPAF/CPAF/CP FF | Boeing, Seal Beach, CA | 573.536 | 246.789 | Oct-02 | 120.380 | Nov-03 | 131.072 | Oct-04 | Continuing | TBD | 1,944.179 |
| IIR Modernization Development (F0470100C0006) | CPIF | Lockheed Martin, King of Prussia, PA | 65.050 | 9.736 | Nov-02 | 1.000 | Feb-04 | 0.500 | Feb-05 | Continuing | TBD | 119.428 |
| GPS III Modernization (F0470101C0008) | FFP | Lockheed Martin, King of Prussia, PA | 15.767 | 0.000 | | 0.000 | | 0.000 | | 0.000 | 15.767 | 20.052 |
| GPS III Modernization (F0470101C0010) | FFP | Boeing, Seal Beach, CA | 16.000 | 0.000 | | 0.000 | | 0.000 | | 0.000 | 16.000 | 20.812 |
| Control Segment Support | MIPR/PO | Various Gov't agencies | 0.000 | 2.776 | | 3.625 | | 1.829 | | Continuing | TBD | TBD |
| EELV Mission Unique Svcs & Clock Development | MIPR/Other SPO contracts | NRL & contractors | 14.930 | 4.687 | | 4.785 | | 2.075 | | Continuing | TBD | TBD |
| Stewardship | MIPR | | 7.274 | 0.000 | | 4.600 | | 4.700 | | Continuing | TBD | TBD |
| Accuracy Improvement Initiative (AII) (IRAQI FREEDOM FUND) | FPAF/CPAF/CP FF | Boeing, Seal Beach, CA | 0.000 | 10.000 | | 0.000 | | 0.000 | | Continuing | TBD | TBD |
| Subtotal Product Development | | | 696.206 | 273.988 | | 134.390 | | 140.176 | | Continuing | TBD | TBD |
| Remarks: None | | | | | | | | | | | | |
| <u>(U) Support</u> | | | | | | | | | | | | |
| System Engineering/Support | Various | FFRDC (Aerospace/Mitre), SETA | 30.436 | 3.340 | Oct-02 | 3.400 | Oct-03 | 1.168 | Oct-04 | Continuing | TBD | TBD |
| GPS Modernization Tech Spt | | | 43.249 | 0.000 | | 0.000 | | 0.000 | | Continuing | TBD | TBD |
| Miscellaneous | Various | Various | 3.231 | | | | | | | 0.000 | 3.231 | |
| Subtotal Support | | | 76.916 | 3.340 | | 3.400 | | 1.168 | | Continuing | TBD | TBD |
| Remarks: None | | | | | | | | | | | | |
| <u>(U) Test & Evaluation</u> | | | | | | | | | | | | |
| Flex Power Testing (F0470100C0006) | FPAF/CPAF/CP | Lockheed Martin, King | 0.000 | 1.588 | Mar-03 | 2.000 | Feb-04 | 2.000 | Feb-05 | Continuing | TBD | TBD |

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| Exhibit R-3, RDT&E Project Cost Analysis | | | | | | | DATE February 2004 | | | |
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| | FF | of Prussia, PA & various gov't activities | | 0.000 | 1.588 | 2.000 | 2.000 | Continuing | TBD | TBD |
| Subtotal Test & Evaluation | | | | 0.000 | 1.588 | 2.000 | 2.000 | Continuing | TBD | TBD |
| Remarks: None | | | | | | | | | | |
| (U) | <u>Management</u> | | | | | | | | | |
| | Various SETA & FFRDCs | FFRDC (Aerospace) & SETA | | 0.000 | 5.120 | 5.000 | 5.000 | Continuing | TBD | TBD |
| Subtotal Management | | | | 0.000 | 5.120 | 5.000 | 5.000 | Continuing | TBD | TBD |
| Remarks: None | | | | | | | | | | |
| (U) | Total Cost | | | 773.122 | 284.036 | 144.790 | 148.344 | Continuing | TBD | TBD |

Exhibit R-4, RDT&E Schedule Profile

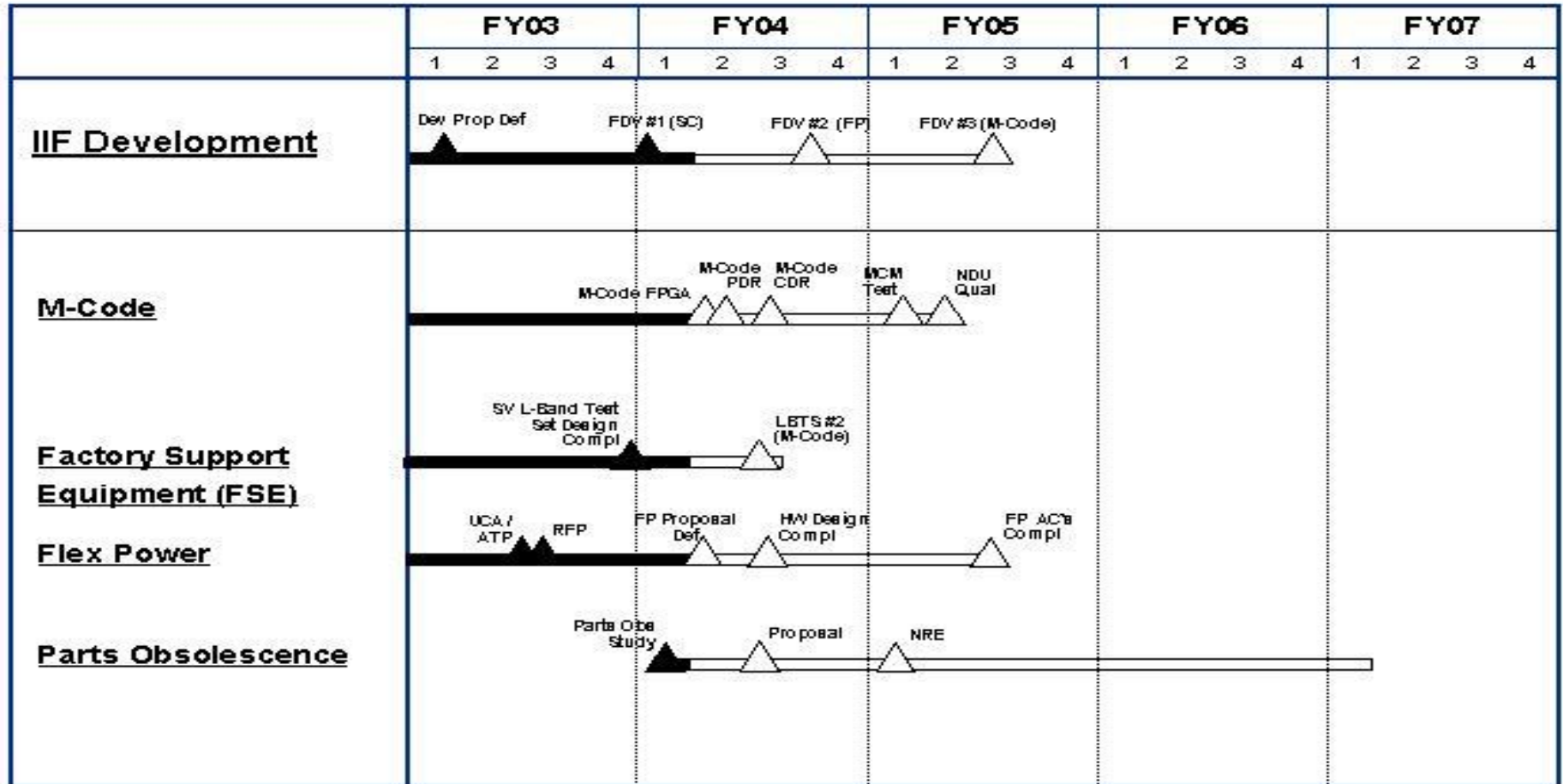
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BUDGET ACTIVITY
07 Operational System Development

PE NUMBER AND TITLE
0305165F NAVSTAR GPS (Space)

PROJECT NUMBER AND TITLE
3030 NAVSTAR GPS (Space & Control)



FDV - Final Design Verified
PDR - Preliminary Design Review
NDU - Navigation Data Unit
RFP - Request for Proposals

FPGA - Field Program Gate Array
CDR - Critical Design Review
SV - Space Vehicle
HW - Hardware

LBTS - L-Band Test Set
MCM - Multi-Chip Module
ATP - Authority to Proceed
NRE - Non-Recurring Engineering

Exhibit R-4, RDT&E Schedule Profile

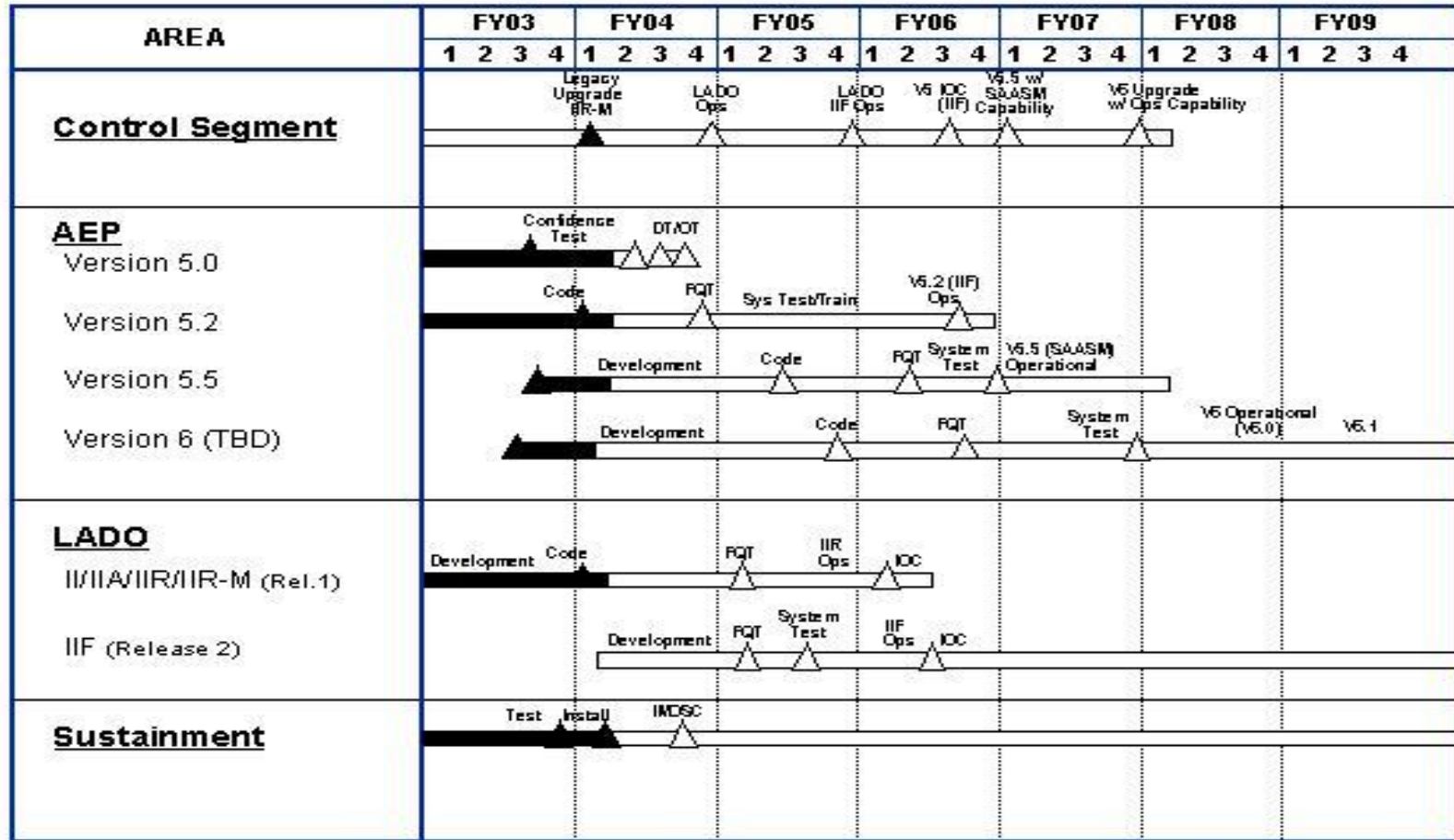
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BUDGET ACTIVITY
07 Operational System Development

PE NUMBER AND TITLE
0305165F NAVSTAR GPS (Space)

PROJECT NUMBER AND TITLE
3030 NAVSTAR GPS (Space & Control)



AEP - Architecture Evolution Plan
 IOC - Initial Operating Capability
 DT/OT - Developmental Testing/Operational Testing
 FQT - Formal Qualification Test

LADO - Launch, Anomaly and Disposal Operations
 SAASM - Selective Availability Anti-Spoofing Module
 IMOSC - Integrated Mission Operation Support Center

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| Exhibit R-4a, RDT&E Schedule Detail | DATE February 2004 |
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| | | |
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| BUDGET ACTIVITY 07 Operational System Development | PE NUMBER AND TITLE 0305165F NAVSTAR GPS (Space) | PROJECT NUMBER AND TITLE 3030 NAVSTAR GPS (Space & Control) |
|--|---|--|

| | <u>FY 2003</u> | <u>FY 2004</u> | <u>FY 2005</u> |
|---|----------------|----------------|----------------|
| (U) <u>Schedule Profile</u> | | | |
| (U) Enhanced IIA IMOSC Development complete | 3Q | | |
| (U) IIF IMOSC Development Complete | | 4Q | |
| (U) Develop Launch Anomaly & Disposal Ops (LADO) System - Release 1 SW Design begins | 3Q | | |
| (U) LADO Release 1 delivery to site | | 3Q | |
| (U) Continue OCS Architectural Implementation-Version 5.0 (COTS upgrade) delivery to site | 2Q | | |
| (U) Modernized Monitor Station Receiver Element (M-MSRE) development begins | 3Q | | |
| (U) Version 5.2 (IIF baseline) delivery to site | | 2Q | |
| (U) Version 6 Development Begins | 3Q | | |
| (U) GPS Block IIF Development Complete | | | 2Q |
| (U) Legacy Accuracy Improvement Initiative (AII) Capability complete | | 4Q | |